Age
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The RUBBER AGE

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LATE NEWS of the Industry

Goodyear Comes Through 1931 With Net Earnings of $5,454,000—Sales Drop 22 Per Cent.

Reserves Are Set Aside for Exchange Losses and Depreciation in Securities—Net Profit After All Charges Are Deducted Is $1,328,623

IN spite of a continued decline in dollar value of sales throughout 1931 and heavy charges arising out of world-wide deflation in values, Goodyear Tire and Rubber Company came through the twelve months with net earnings of $5,454,046, after deducting depreciation, federal taxes, interest and profits of subsidiaries, and after writing down raw materials and material content of finished products to present levels.

The company arbitrarily deducted an amount of $3,414,039 to provide a reserve for unusual fluctuations in the foreign exchanges of various countries and $711,384 as a reserve for the depreciation in value of United States and Canadian government securities.

These deductions left $1,328,623 of net profit to be carried to surplus. In 1930 the $9,912,232 was carried to surplus.

Consolidated net sales for 1931 were $159,199,831 compared with $204,063,228.99 for 1930, or a decline of 22 per cent.

Consolidated earnings for 1931 before interest and discount charges were $9,952,655 after providing $11,945,597 for depreciation and after Federal income taxes and provision for valuation of inventories and commitments at cost or market whichever was lower. In 1930 the consolidated earnings after similar deductions were $14,798,718.

P. W. Litchfield, president of Goodyear, in giving out the annual statement, said:

"The company's strong financial position and experienced organization has enabled it to well maintain its position in the rubber industry. Major economies were effected during the year, through salary and wage reductions, in further improvements in the efficiency of factory operations and in the distribution of products."

Shrinkage in sales from more than $204,000,000 in 1930 to less than $160,000,000 in 1931 reflected the depression that struck the tire industry here and elsewhere but the percentage of decrease fell off as compared with the situation that existed at the end of 1930 when the company's official report showed a 20 per cent drop from 1929 levels.

Capital and surplus as of Dec. 31, 1930 totaled $26,289,255.72 according to the profit and loss statement and further adjustments to stock accounts increased that item to $26,516,181.89 as of the end of 1931.

Capital charges written off during the year and reserves for losses on liquidation of subsidiary properties, obsolete equipment and so forth totalled $5,000,000 on the com-

Scanning the Headlines

GOODYEAR *beats the depression with net earnings of almost five and a half millions . . . . Domestic consumption of rubber jumps up in January . . . .* FISK *reorganization scheme strikes severe opposition . . . .* GOODRICH'S *financial statement for* 1931 *shows big loss . . . . Tire production in December advanced slightly . . . . Akron plants report increased activities . . . .* GOODYEAR *of Canada shows good profit for last year . . . . Scrap rubber dealers to meet in New York in March . . . . Rubber features at New York Toy Fair . . . .* GOODRICH *dramatizes its* 1931 *sales policies . . . . Canadian rubber exports show large decrease . . . . Manufacturers are urged to send in promptly their returns for the* 1931 *Census of Manufactures.*

pany's books, leaving the capital and surplus as of the end of the year at $21,516,181.89.

The consolidated balance sheet as approved by Price, Waterhouse & Co., certified public accountants of New York, discloses that land, buildings and equipment of the company were valued at $95,450,522.44 and that "income notes of the Credit Corp. of Akron, plus mortgage and bond investments" provided an additional credit of $3,358,594.73 to assets.

Inventories were listed at $45,190,307.83 and good will, patents and trademarks are written down to $1.

Capital stock of the Goodyear Tire & Rubber Co., as of the Dec. 31, 1931, statement is fixed at 766,524 shares of common outstanding valued at $76,652,400. In addition, more than 1,437,000 shares of preferred stock is outstanding valued at $1,607,514.50.

Sinking fund requirements on both the First Preferred Stock and the First Mortgage and Colateral Trust Bonds of the Company have been met during the year, resulting in the redemption of 4,161 shares of First Preferred Stock and $713,500 of bonds; also all sinking fund requirements of preferred stock and funded debt of subsidiary companies have been fully discharged.

Dividends on the Company's First Preferred Stock and on the preferred stocks of subsidiary companies have been declared and paid in full during the year; dividends on the Company's common stock were paid at the rate of 75c per share for the first three quarters and were reduced to 25c per share for the last quarter of the year.

The consolidated balance sheet of Goodyear Tire and Rubber Company, and subsidiary companies, as of December 31, 1931, compares as follows:

Assets

	1931	1930
*Land building machinery equipment etc	$95,450,522	101,927,478
Investments	8,902,857	5,939,417
Inventories	45,190,308	57,006,291
Accounts and Interest receivable	16,151,402	22,184,736
Can call lns & gov sec	§3,972,362	3,390,775
Call loans	.....	.....
Cash	21,455,899	29,397,251
U. S. Government securities	§12,184,661	4,521,014
Pats. & gdwl.	1	1
Deferred charges	4,054,681	3,379,163
Total	$207,362,693	227,746,126

Liabilities

First preferred $7 cum.	†$76,652,400	$78,457,900
Preferred stock	.....	.....
Common stock	‡1,607,514	1,587,035
Subsidiary stock	16,621,797	17,611,317
Funded debt	55,874,500	56,588,000
Fund debt of subsidiaries	5,143,493	6,825,920
Accounts and federal tax payable	8,732,656	8,983,917
Accrued dividend and interest	962,117	2,466,774
Reserves	4,105,837	5,140,050
Capital surplus	21,516,182	26,289,256
Earned surplus	16,146,197	23,795,957
Total	$207,362,693	227,746,126

*After depreciation. †Represented by 766,524 no-par shares. ‡Represented by 1,437,111 no-par shares. §Securities at market.

January Rubber Consumption Shows Gain of 30 Per Cent But Stocks Increase

CONSUMPTION of crude rubber by manufacturers in the United States for the month of January amounted to 27,962 long tons as compared with 21,409 long tons for December 1931, and represents an increase of 30.6 per cent which is about seasonal, according to statistics released by The Rubber Manufacturers Association today.

This organization reports imports of crude rubber for the month of January to be 31,298 long tons, a decrease of 39.7 per cent under the December figure and 15.6 per cent below January a year ago.

This association estimates total domestic stocks of crude rubber on hand January 31, at 322,860 long tons, which compares with December 31 stocks of 322,826. While January stocks show practically no change as compared with December, they were 54.1 per cent above stocks the same date last year.

Crude rubber afloat for the United States ports on January 31 amounted to 77,244 long tons as compared with 53,940 long tons on December 31 and 56,188 long tons on January 31, 1931.

The total American rubber supply at the end of January, consisting of stocks on hand and shipments en route, amounted to 400,104 long tons, compared with 376,696 tons at the close of December and 265,674 tons at the end of January a year ago. The supply is, therefore, at a new record high figure; also an increase of more than 50 per cent for the year.

Fisk Reorganization Plan is Opposed And Shareholders Committee Formed

A COMMITTEE of stockholders of the Fisk Rubber Company has been formed to oppose the newly proposed reorganization plan put forward by the note holders' committee, with Andrew J. Miller, of Hallgarten and Company, as chairman.

The plan of the note and bond holders' committee made no provision for stock equities, it is claimed. In the statement of the opposing stockholders' committee the stand is taken that the new plan takes no cognizance of the fact that as recently as April, 1929, common stockholders paid more than $8,000,000 to the company. It relates further that unsuccessful negotiations were held with the committees representing the senior securities with the object of having at last 50,000 shares of new common stock distributed to holders of old preferrd and common stock.

The stockholders' committee contends the company should not be reorganized now. Its statement says the proposal was rejected on the ground that it would dilute the stock but that nevertheless the senior security committees propose to sell at a nominal price to Richard H. Swartwout, who would be chairman of the reorganized company, not less than 25,000 new common shares, with options to buy 25,000 shares more, at $12.50 a share.

The new reorganization plan has also been opposed by John N. Willys, a holder of senior securities and now ambassador to Poland.

"It should be noted," Mr. Willys said, "that in addition to the net current assets of approximately $15,300,000 which includes about $6,800,000 in cash and United States Treasury bills and notes, the company has fixed assets carried on the books in an amount in excess of $23,000,000. If, as is contemplated, the company continues its manufacturing operations, the net current assets are enough in amount almost to cover the total funded debt without assigning any value whatsoever to the fixed assets. But the replacement cost of plants actually in use would run into several millions.

It readily will be seen that the reorganization committee has not obligated itself to furnish any new capital.

"Furthermore, in consideration of the interests of all the security holders of the Fisk Rubber Company, including the potential interest of junior security holders, I am of the opinion that the present most certainly is not a suitable time to carry out the proposed reorganization. The company, with its present management, is in the process of carrying out its established program for the important part of

the 1932 season. Reorganization at this time would thus involve a severe handicap on the continuance of the company's business and work a hardship on every holder of every kind of Fisk security."

A reply to Mr. Willys' criticism was made by Orrin G. Wood, in a statement urging the prompt acceptance of the reorganization plan "if the business of the company is to be saved."

"The reorganization committee does not believe that Mr. Willys' suggestion to defer all action for another nine or ten months is likely to lead to any sound plan which will prove more satisfactory to the security holders than the present one, and feel sure that delay can only work grave injury to the business of the company," Mr. Wood stated.

Continuation of receivership for eight or nine months might lead to "the very real danger of permanently destroying the dealer organization of the company," the committee states. In answer Mr. Willys' criticism on the lack of underwriting of new money it is stated that this is not essential as there will be sufficient working capital without it.

Spring Meeting of the Akron Rubber Group Set for March 7

THE Akron Group of the Rubber Division, A. C. S., will hold its spring meeting on the evening of March 7th at the Akron City Club. Three papers, covering quite a diversity of subjects, will be presented.

"The Oxides of Iron as Colors in Rubber" by J. W. Ayers, director of research of C. K. Williams & Company, will cover the elements of color, the manufacture of iron oxide, proper methods of evaluating and testing colors for rubber and the impurities that might be present in these colors and their effects on rubber.

"Zinc Oxide" will be the subject of a paper presented by the New Jersey Zinc Sales Company. This paper will be divided into three divisions and will present some interesting data on six different types of oxides which have widely different characteristics in regard to particle size, nature of surface, rate of cure, dispersability and work of extension. As planned at the present time, these papers will be presented by G. F. A. Stutz, George Haslan and B. R. Silver.

A. J. Musselman, inventor of the well known Musselman tire will discuss his own tire and those of other makes commonly referred to as air wheels, 'doughnuts' and 'pillow' tires.

Tire Production in December Showed Increase But Shipments Declined

SHIPMENTS of pneumatic casings for the month of December amounted to 2,781,950 casings, a decrease of 3.7 per cent under November this year and 17.2 per cent below December 1930, according to statistics released by the Rubber Manufacturers Association.

This organization reports production of pneumatic casings for December to be 2,643,221 units, an increase of 5.7 per cent as compared with November this year, but were 6.1 per cent below December a year ago.

Pneumatic casings on hand December 31st amounted to 7,774,720 units, a decrease of 1.8 per cent under November and 13.6 per cent below December 31st, 1930.

Shipments of pneumatic casings for the year 1931 amounted to approximately 50,060,690 casings, a decrease of 6.7 per cent as compared with 1930 and 27.9 per cent below 1929.

Production of pneumatic casings for 1931 amounted to 48,740,275 casings, a decrease of 4.4 per cent below 1930 and 29.1 per cent under 1929.

The association's estimates are based on reports furnished by manufacturers who produce approximately 80 per cent of the total for the United States, but have been adjusted to represent 100 per cent in the figures quoted above.

Goodrich Reports a Net Loss in 1931 Of $8,815,653, With Sales at $115,165

FOLLOWING the regular monthly meeting of the board of directors of The B. F. Goodrich Company held in New York City, on February 9, 1932, a preliminary financial statement was released.

Consolidated net sales of the Company for the fiscal year ended December 31, 1931, were approximately $115,165,000 compared with $155,256,000 in the previous year. The general business recession in 1931 coupled with lower levels of selling prices account for the lower dollar sales.

Operating income for the year amounted to $6,594,563 before provision for depreciation, interest and year-end charges for losses in foreign exchange and write-downs of inventories and material commitments to the low level of market prices prevailing on December 31 last.

Depreciation charges for the year amounted to $5,678,903 and interest to $3,908,043. The year's operations were charged with losses in foreign exchange of $1,660,355 and write downs to December 31, 1931 market prices of raw materials on hand and on commitment and material content of unfinished and finished goods on hand amounting to $4,162,914. The above charges created a net loss of $8,815,653 which was transferred to surplus account. This compares with a net loss of $8,374,148 in 1930.

Cash in banks and on hand amounting to $19,722,000. Total current assets amounted to $67,536,000 and current liabilities $6,160,000, making a ratio of approximately 11 to 1.

The regular audit of the company's accounts is now in progress and when completed, the annual report of the company will be published.

Rubber at the Toy Fair

RUBBER toys and novelties play a prominent part at the annual New York Toy Fair which is being held at the present time in various hotels and office buildings in the toy wholesale district of the Metropolis, including the Hotels McAlpin and the Fifth Avenue Building. The Fair will close February 27 and open in Chicago, April 25. The chief exhibitors among the rubber goods manufacturers included the following:

Baumgarten & Co., Fifth Ave. Bldg.—Rubber Printing Sets.

Collette Mfg. Co., Hotel McAlpin—Beach and Play Balls, Bathing Accessories and Swimming Tubes.

Essex Rubber Company, Hotel McAlpin—Playballs, Swim Sets, Rubber Quoits.

Fox Products Co., 148 West 24th St.—Sporting Goods, Baseball and Boxing Gloves.

Hutchinson Bros. Leather Co., Hotel McAlpin—Sporting Goods; Foot, Basket and Soccer Balls.

McKinnon Leather Products Co., 14 East 15th St.—Foot, Basket & Soccer Balls, Boxing Gloves, Striking Bags, Bats.

Miller Rubber Prod. Co., Fifth Ave. Bldg.—Rubber Balls, Inflated Toys, Water toys; Playground toys.

Rex Rubber & Nov. Co., 96 Warren St.—Water Floats, Rubber Toys, Novelties and Balloons.

Superior Type Co., Fifth Ave. Bldg.—Rubber Printing Toys.

Webb, C. B., Co., Fifth Ave. Bldg.—Weaver Health Balls.

(Other news of the industry will be found on Pages 449-454)

Program of Papers at the Rubber Division Meeting at Detroit

THE list of the papers to be presented at the annual Spring meeting of the Rubber Division of the American Chemical Society, which will meet at Detroit, Mich., February 25-26, has been announced and appears below. The headquarters of the Division at Detroit will be the Fort Shelby Hotel.

After the morning session on February 25, the afternoon will be devoted to an inspection trip through various factories and in the evening the usual banquet will be held. The banquet committee is headed by S. M. Caldwell and includes Messrs. Lee, Merker, Wolf, Lemon, Nelson, Stanton and Northrup.

E. R. Bridgwater, chairman of the Rubber Division, will preside at the sessions and at the banquet.

Program of Papers

THURSDAY MORNING

The Reinforcement of Rubber by Pigments. The Effect of Size and Shape of Pigment Particles on the Stiffness of Rubber. C. E. BARNETT.

Rubber-Pigment Ratios in Batch Control. HOWARD L. WILEY.

Grit in Carbon Black. The Effect on the Flexing Resistance of Vulcanized Rubber. JOHN N. STREET.

The Effect of Cadmium Compounds on Typical Organic Accelerators During Vulcanization. M. K. EASLEY and A. C. EIDE.

A Method for Maintaining Uniformity in Factory Mixed Stocks. J. E. MCCARTY and EDWARD COUSINS.

Heat Resisting Inner Tube Stocks. E. W. BOOTH.

Studies in the Vulcanization of Rubber V. Dielectric Constant and Power Factor of Vulcanized Rubber. DONALD W. KITCHIN.

Reaction Between Zinc Soaps and Mercaptobenzothiazole. HARLAN A. DEPEW.

FRIDAY MORNING

Some Experiences with a Direct Accelerator Adsorption Test. F. H. AMON and R. K. ESTELOW.

Solubility of Organic Compounds in Rubber. T. C. MORRIS

Effect of Curing Temperature on the Quality of Vulcanized Rubber. N. A. SHEPARD and J. N. STREET.

Natural and Synthetic Rubber IX. Constituents of the Rubber Hydrocarbon. T. MIDGLEY, JR., ALBERT L. HENNE and MARY RENOLL.

Report of Physical Testing Committee. R. P. DINSMORE, *Chairman.*

Report of Papers Committee. H. L. TRUMBULL, *Chairman.*

Business Meeting.

"Ureka-C"

THE Rubber Service Laboratories Company of Akron, Ohio, have announced the addition of a new accelerator to their line of chemicals for the rubber industry. This new accelerator, called "UREKA C," is an entirely new type of chemical compound developed by the company's research laboratories.

Ureka C is a solid which tends to soften on the mill and flux into the rubber. When used alone it is very mild in its action, but by the addition of amines, such as DPG, Guantal (DPG Phthalate supplied by the Rubber Service Laboratories Company), or a aldehyde amines, the speed of acceleration is greatly increased. The speed of acceleration can be regulated by controlling the amount of amine material added.

By the proper use of activators Ureka C will give low modulus or high modulus stocks, depending on the ratio and type of activator used. This permits great flexibility in the plant and allows the compounder to choose exactly the right type of acceleration for each particular stock.

Ureka C, in conjunction with the various activators, is recommended by its manufacturers for use in tires, tubes, footwear and mechanicals. When Ureka C is used in conjunction with DPG or Guantal, excellent white stocks can be obtained. This same combination of Ureka C with DPG or Guantal can be satisfactorily used along with organic colors.

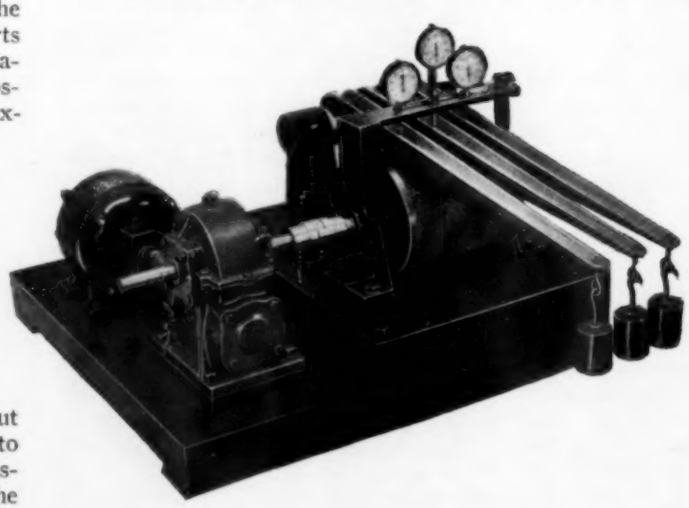
Abrasive Resistance Machine

A NEW machine for testing the abrasive resistance of rubber compounds is the latest product of the American Instrument Company, 774 Girard Street, N. W., Washington, D. C., manufacturers of laboratory apparatus.

It is claimed by the manufacturers that this device is the result of several years of research on the part of the personnel of the U. S. Bureau of Standards in their efforts to produce a machine that would reproduce in the laboratory, in a relatively short period of time, as nearly as possible the conditions of wear on rubber, which may be expected in normal use, over a long period of time.

The machine consists essentially of a drum 6" in diameter covered with standard garnet paper held in place by heavy elastic rubber bands. The drum is driven by a ¼ HP motor AC or DC through a 40:1 speed reducer. Three independent levers, each weighted at their unsupported ends, carry on their under surfaces the test specimens. These are 1" square by ¼" thick and three specimens can be tested simultaneously. The speed of the machine is substantially constant and the revolutions are counted by a Veeder counter attached to the drum axis but not shown in the photograph. The counter may be reset to zero after each test. The wear on each specimen is measured by an Ames Dial Gauge readable to 1/1000". The weight of the lever arm is so adjusted that a pressure of exactly 5 pounds is exerted on the specimen. The garnet paper used is of standard manufacture, and therefore readily obtainable.

The dimensions of the machine are 24" x 24" x 14".



The Influence of Reclaimed Rubber *on the Behaviour of* Certain Rubber Accelerators*

By JOHN S. PLUMB

Chemical Laboratories, U. S. Rubber Reclaiming Co., Inc., Buffalo, N. Y.

THE wide variety of chemical composition and use of organic accelerators on the market limits a discussion of the influence of reclaimed rubber on the behavior of these catalysts to a few compounds typical of the groups most widely used by manufacturers of rubber goods. Accelerators have been selected from each of three well known groups which behave differently both with crude and with several kinds of reclaims. The accelerators of the classes we have chosen have found general use in practically all branches of compounding, and moreover are appreciably affected by reclaimed rubber. While it cannot be claimed that other accelerators of the same group will behave similarly, we may assume that the results shown are indicative of the general tendency of each class. In this work we have used no fillers, anti-oxidants or any compounding ingredients which might influence the type of cure, other than the necessary activators.

First place has been given to DPG, representative of the di-substituted guanidines, on account of the length of time they have been in general use; secondly, we have chosen Captax, the trade name of mercapto-benzo-thiazole, and finally the butyraldehyde aniline product marketed as "808," as an example of the aldehyde amine condensation or reaction products. The great amount of experimental work necessary has caused the omission of countless accelerators of proven value, used generally in many fields, but their number is so large that it has been impossible to include them in this discussion.

In selecting reclaims, those types most widely used have been taken, representing both acid and alkali process, and the pan process

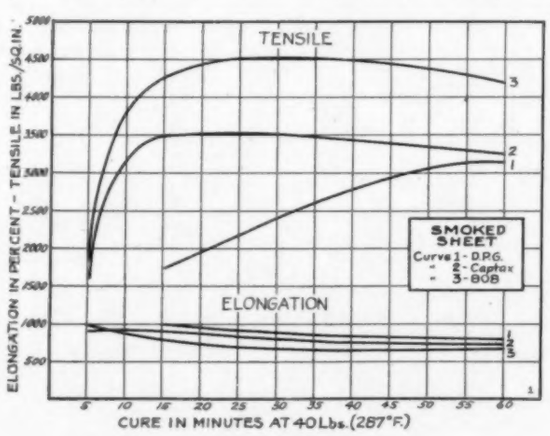


FIGURE 1

which is used for the reclamation of fiber-free scrap. This range covers the compounding of tires, inner tubes, insulated wire and mechanical goods of many kinds, calendered, extruded and molded. All curing curves have been obtained from steam platen press cures made under standard conditions in order to insure maximum uniformity of results. The reclaims used were, (1) whole tires reclaimed by the alkali process, (2) whole tires by the acid process, (3) boot and shoe by the acid process, and (4) inner tubes by the pan process.

In order to calculate the percentage of accelerator and sulphur to be used with each of these four grades of reclaimed rubber, an analysis was made for ash, acetone extractable and total sulphur. The unextractable, non-mineral matter is assumed to be rubber hydrocarbon. While this figure is not technically correct, it is for all commercial purposes sufficiently accurate for the calculation of percentages of curatives.

Experimental

All batches were mixed on the laboratory mill with time and temperature control, the mill rolls kept constantly at 100 F. and the time of mixing varying with the type of stock. For instance, whole tires reclaimed by the alkali process were mixed altogether nine

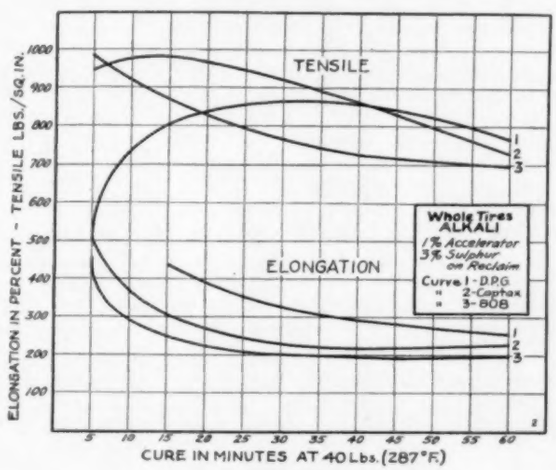


FIGURE 2

minutes, while the same material prepared by the acid process need be mixed only eight minutes, inner tubes by the pan process eleven minutes, and boot and shoe stock made by the acid process, ten minutes. The control batch of blended smoked sheets was put up as follows:

Smoked sheets	100
Zinc oxide	5
Sulphur	3
Accelerator	1
Zinc Laurate	1
	110

In all the curves, compound Number 1 will be that containing DPG. Number 2 will be ,that using Captax, and Number 3, using 808.

Figure 1 shows the curing curves of these three accelerators

(*) Paper presented at October, 1931, meeting of Chicago Group, Rubber Div., A.C.S.

when mixed in the above formula and cured at forty pounds steam pressure, 287° F.

The stock containing DPG barely reaches its optimum in 60 minutes, while both Captax and 808 are fully cured in less than 30 minutes. The elongation figures show a marked steadiness throughout the range, while the tensiles fall off only very slightly. It will be noticed that the 808 and Captax curves are quite similar in type, reaching the maximum in approximately the same length of time and commencing the overcure at the same point. DPG, on the other hand, rises very slowly to its maximum at 60 minutes.

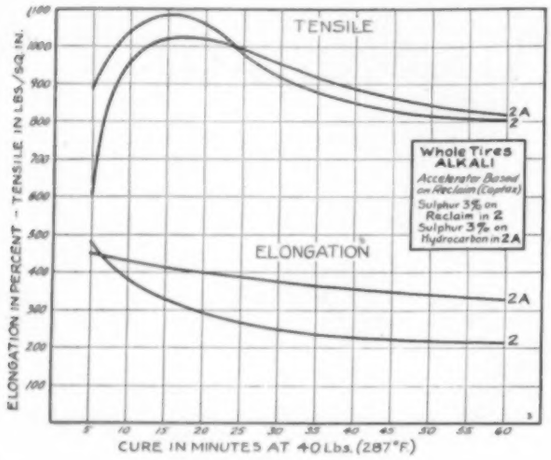


FIGURE 3

Keeping these curves, that is, their relative positions, and their separate types in mind, we have a basis of comparison for the reclaim compounds. The same formula was used in the first test, substituting whole tires reclaimed by the alkali process. Note that the percentages of curatives have not been changed from the first mix. This was done to establish definitely the importance to be attached to the hydrocarbon value of the reclaim, as determined from analysis. In Figure 2 the results of this are shown very strikingly. In this case the reclaim has caused an extra acceleration of the cure of such a magnitude that the 808 and Captax have reached greatest tensile and elongation in less than half the time required in the case of crude. Captax is at the peak of the curve in 5 minutes, falling off rapidly in as little as ten minutes. On the other hand 808 is somewhat slower, coming to the top in 10 minutes, although the five-minute mark is very close to the top. This stock also falls off quite rapidly. Correspondingly the DPG is hastened in its action so that its maximum occurs in 30 minutes as against 60 for crude. The type of curve has been profoundly altered with Captax and

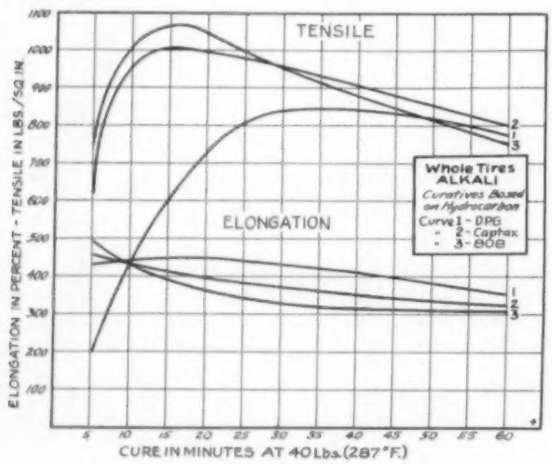


FIGURE 4

808 but hardly at all with DPG, merely a backing up of each point. The elongation figures do not seem to be affected materially.

The next step with the whole tire alkali reclaim was to reduce the amount of accelerator to one per cent, based on the hydrocarbon content, leaving the sulphur at the same point as in Figure 2.

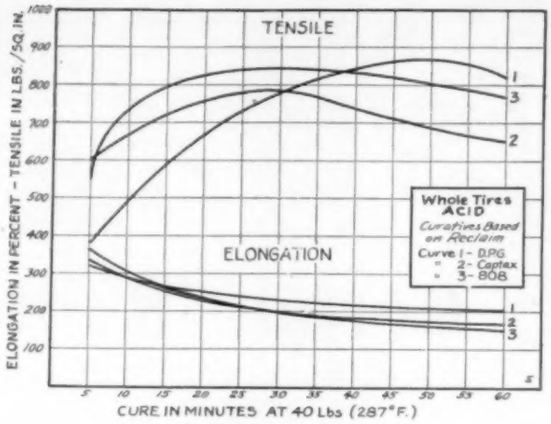


FIGURE 5

Against this stock was run a similar batch, reducing not only accelerator to a percentage of the hydrocarbon but also the sulphur, using three per cent on the gum. The curves obtained in this test are shown in Figure 3. The test was made using only one accelerator, Captax. The peak tensile is slightly lowered when both curatives are cut to the lower figures, but the cure shows a much flatter curve, and the elongation is increased throughout the range. Accordingly, the percentage of curative has been based on the hydrocarbon content of the reclaims throughout the investigation.

This last test was checked in the same manner with an acid processed tire stock, which is shown below in the discussion of that type. The curves obtained from the three accelerators on alkali prepared tire stock, using the low amount of accelerator and sulphur, as just explained, are shown in Figure 4. There is still a decided altering of the type of curve for the two faster accelerators, Captax and 808, but DPG remains substantially the same except for a more gradual rise. In all cases the maximum tensile is reached more slowly, and the elongation high marks are above those in Figure 3. The overcure of 808 is more decided than that of Captax and the two are more nearly together than they are with crude. This may be taken to indicate that the alkali stock affects 808 more rapidly. With this reclaim, DPG is probably the safest for long cures, as the ends of the curves are all in close proximity.

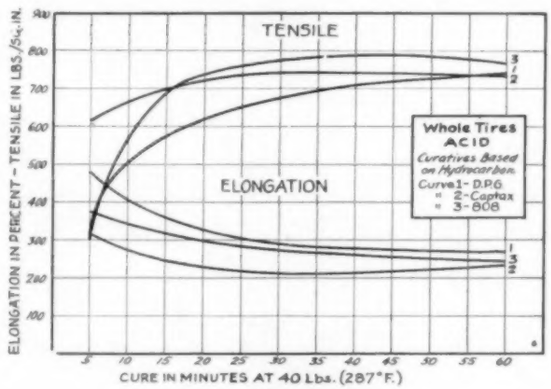


FIGURE 6

For short cures, however, it would be well to cut even shorter than one per cent on the hydrocarbon for safety, when using the faster accelerators.

The same procedure with acid processed whole tires yields much different results. It will be seen from Figure 5 that 808 holds a very long flat curve, this with the curatives calculated on the basis of the reclaim, not on the hydrocarbon. Captax rises fastest, although 808 is close on its heels and crosses it in about six minutes. DPG shows an unusually high maximum tensile as well as high elongation throughout. These curves are all too fast, rising in too short a time for safety, but they do not show the pronounced immediate overcure noticed with alkali reclaims. Though they rise quickly, they hold the top longer and do not fall rapidly. When the curatives are both reduced to a percentage of the hydrocarbon, the curves assume more of the character of the crude mixes. Cap-

tax reaches its optimum before the others, Figure 6, but all three end in the same place with no overcuring noticeable. The Captax curve exhibits a shorter time of rise with an absolutely flat range, while 808, though slower, runs higher and shows the same long range.

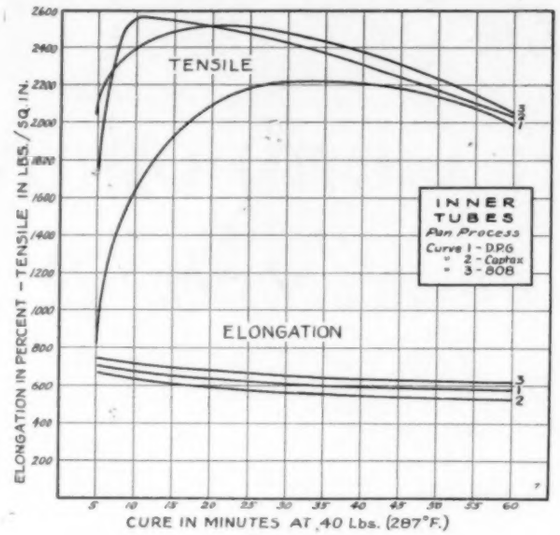


FIGURE 7

Here the DPG is practically the same in character as it is with crude. The conclusions to be drawn from these results are that this reclaim may be safely handled with any of the three accelerators, and that the choice depends on the size of the article and the time of cure desired. In this case the more active accelerators may be used quite safely even for the long cures, due to the very extended curing range.

Proceeding from the standard tire grades to the inner tube stocks, a very rapid rise to maximum is noted with the ultra accelerators showing both very close together with DPG lagging behind, Figure 7. Captax is somewhat faster in the first part of the range, but holds a fairly flat curve throughout, dropping off at practically the same rate as 808. DPG reaches a respectable maximum in half the time necessary to arrive at the same point with crude. All the elongations are very nearly straight lines.

To produce the desired cure with stocks of this type it is only necessary to adjust the amount of curative in order to reach the peak at the desired time, as will be seen from Figure 7A. Here we have prepared the inner tube reclaim in a compound containing only half the amount of accelerator and sulphur that was used in obtaining the curves shown in Figure 7. With this one-half per cent accelerator and one and one-half of sulphur calculated in the hydrocarbon, we find an extension of the curing range in all three stocks. 808 rises at about the same rate but holds its range longer,

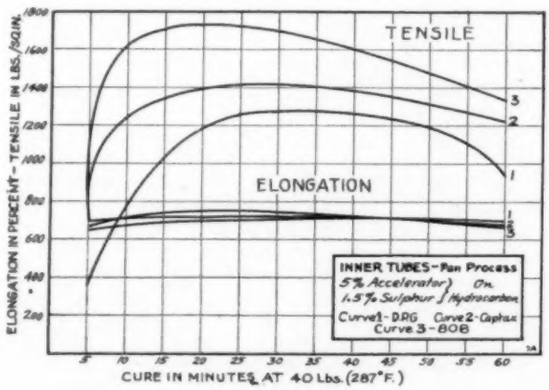

TENSILE
ELONGATION
INNER TUBES - Pan Process
5% Accelerator) On
1.5% Sulphur) Hydrocarbon
Curve 1 - DPG Curve 2 - Captax
Curve 3 - 808
ELONGATION IN PERCENT - TENSILE IN LBS./SQ.IN.
CURE IN MINUTES AT 40 Lbs. (287°F.)

FIGURE 7A

not falling quite as rapidly as in the previous test. Captax rises much more slowly and holds a decidedly flatter curve, falling very slightly even at sixty minutes. DPG gives a more pronounced maximum and overcure, but does not rise at any greater rate.

The curves with boot and shoe reclaim are similar in type to those with crude with the exception of 808. Captax is above 808, and the latter does not exhibit the quick rise and long plateau. DPG is accelerated by about 15 minutes with a sharper rise, and in all three stocks the elongation drops steadily. The peculiar part of this test is the 808 curve, which parallels the DPG. In the previous tests this has not been at all pronounced. As a general rule the 808 may be expected to give much higher tensiles than DPG, but in this case the difference is very slight up to the 60-minute cure. It is possible and most probable that some compounding ingredient used by the manufacturers who prepare the goods which become scrap, is responsible for this condition, as the reclaiming process is exactly the same as that used in the preparation of the tire stock.

Conclusions

It is apparent from the results of the foregoing tests, that the most important item in compounding with reclaims is the use of the proper percentage of curative based on the hydrocarbon content of the reclaim. The desired rate of cure must be studied, that is to say, a range of cures should be run, to ascertain definitely the effect

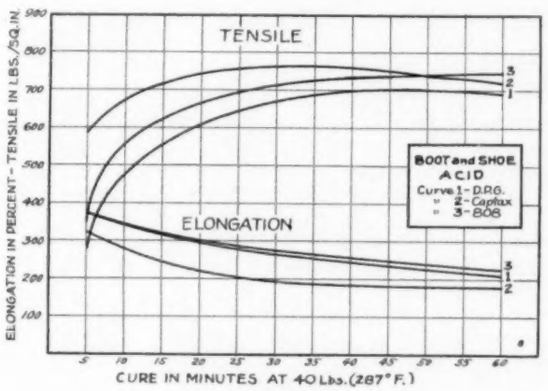


FIGURE 8

of the reclaim on the action of the accelerator, using varying amounts of reclaim. In most cases a decided acceleration may be expected, thereby reducing the amount of accelerator necessary for producing the desired results. We cannot emphasize too strongly the importance of experimenting with cures along the lines set forth in this investigation, in order to be perfectly sure of obtaining maximum efficiency both from the accelerator and from the reclaim. The characteristic of the accelerator is nearly always altered by the addition of any kind of reclaimed rubber, only in that the cure reaches a maximum more rapidly. This change is sometimes desirable, but if not, careful adjustment of the amounts of vulcanizing agents can be made to produce optimum cures at almost any point within quite wide limits.

To illustrate the stabilizing effect that can be obtained from reclaimed rubber, the acid tire stock Figure 5 may be compared with the crude rubber curves, Figure 1, showing the markedly flatter curve with each accelerator in the case of the reclaim.

Latex in Textiles and Leather

THE propaganda department of the Rubber Growers' Association, London, has recently expressed the opinion that latex will be more and more employed in the textile industry, not so much as a proofing material but rather as a filling medium for the cloth. Research has also shown that latex can be effectively used a a filler in certain leather construction, especially in low-grade hides, which could then be utilized for several purposes for which they are not fitted today. The latex, compounded if necessary, would serve as a surface treatment for the hide, thus masking defects such as shear marks, etc.

The Measurement of the Quality of Rubber Compounds *by Means of Abrasion Tests*

By HARLAN A. DEPEW

Research Division of the New Jersey Zinc Company

(*Concluded from February 10, 1932, Issue*)

5. In the Kelly-Springfield machine[24] the samples are mounted on a flexible support which presses against the abrasive wheel (Figure 12.) The outstanding feature is variable pressure and deformation of the sample during the test. Otherwise, this machine is of the constant slip type similar to the angle machine.

6. The Bureau of Standards machine[52, 26] is the simplest of the machines and is especially well adapted to the needs of consumers. It consists of a sample holder held by a constant load against an abrasive cloth disk (Figure 13).

7. In the loose abrasive machine[27] rubber disks are located concentrically about a shaft that is placed in a cup filled with loose carborundum abrasive and the volume losses of the unknowns are compared with that of a standard (Figure 14). A gum stock frequently tests superior to a high grade tread stock, which it is believed, is due to the fact that resiliency or distensibility of the compound under practically zero load plays an important part in extending the abrasive life.

Figure 12—The Kelly-Springfield Machine

With such a large number of widely different machines, the technologist in the laboratory is confronted with a difficult choice when he is required to determine the machine that will best meet his needs. This is especially true inasmuch as the enthusiasm of the inventors of abrasion machines has been such that each inventor has been inclined to present his machine as the "Pillar of Fire" that would lead rubber technologists out of the wilderness. Sigler and Holt made a very important contribution when they stated that most of the machines gave about the same comparative results and that the choice of a machine rested in questions of convenience and accuracy rather than in correlation with service. This statement cannot be too highly endorsed. Other data, including those by Klaman[2], confirms the statement that the various machines give results that check fairly well with the results obtained by tire service. Glancy shows that one of these machines and it might therefore be added most of them also give results that correlate with heel and sole service tests.

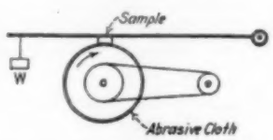


Figure 13—The Bureau of Standards Machine

With heavily loaded stocks the abrasion machine resistances tend to be high and it has been pointed out that overcures test higher than they ought to do on a basis of service tests. Similarly undercures tend to test lower than they ought (Figure 15)[2]. The low values on the undercures may be due to excessive slip (Figure 16)[4], and the high values on overcures are due to failure to weight the tearing action sufficiently high. This difficulty with cure is more academic than real, since most stocks are compared at comparable cures.

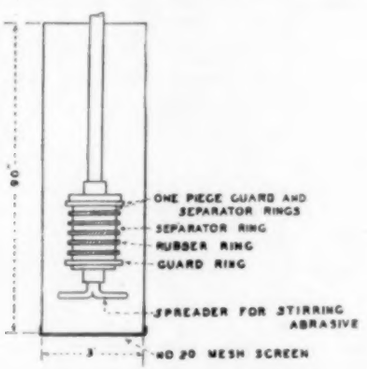


Figure 14—The Loose Abrasive Machine

[24] A. F. Hardman, W. L. MacKinnon, and S. M. Jones, THE RUBBER AGE, Vol. 28, February 10, 1931, page 463.

[52] P. A. Sigler and W. L. Holt, *India Rubber World*, Vol. 82, No. 5, page 63, 1930.

[26] W. E. Glancy, *Proceedings of the A. S. T. M.*, 1931.

[27] W. W. Evans, *Transactions of the A. S. T. M.*, 1923, Vol. 23, page 517.

The loose abrasive machine works differently from the others and takes into consideration the factor of distensibility, and on it a gum stock will test as well or better than the best tire tread. This type of machine is desirable for the development of compounds for sand blast hose and dredge sleeves.

Since correlation with service is not ordinarily a major factor, the choice of a machine will depend on the special needs of individual laboratories and will be determined, at least in part, by the number of tests that the laboratory are running and whether they are being made in a development organization or a consumer's

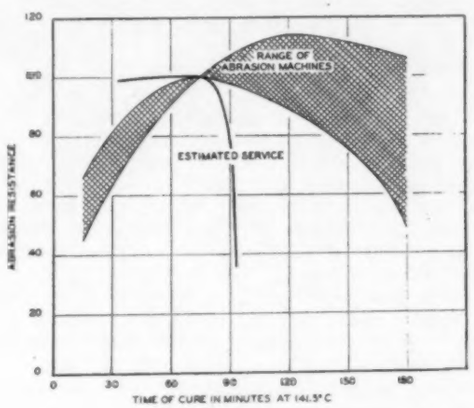


Figure 15
Estimated Service Tests Compared With Machine Tests

testing laboratory. In general, it may be said that the best machine to choose will be the one that will give the best reproducibility of tests and whose cost per test is a minimum. On the other hand, for a laboratory that makes only a few tests, the initial cost of the machine can easily be the deciding factor. In connection with the reproducibility of the test, it should be pointed out that an enthusiast or a very able investigator can get better results with any one of the machines than the average man can from any of the others.

Although these machines are suitable for such widely divergent purposes, as the compounding of tire treads and conveyor belt covers and heels and soles, it does not follow that it is safe to compare a conveyor belt cover with a tire tread stock or with a heel or sole stock, because of the difference in hardness that none of the machines have satisfactorily ironed out. It might be better in radically different types of stocks to use the area under the stress strain curve as a criterion and then to use the abrasion machine in studying the effect of minor changes in this type of compound.

In the light of the present information, it is desirable to devote a few moments to the consideration of an ideal abrasion machine. North[28] has burlesqued abrasion testing because, due to "gumming up" of the abrasive surface, the machines may give abnormally high abrasion resistances on certain low grade stocks compounded with large amounts of stearic acid, which experience has shown should have developed relatively low abrasion resistances. At a meeting of the A. S. T. M. Sub-Committee on the Abrasion Testing of Rubber, it was decided that the "gumming up" of the abrasive surface should receive the first efforts of the committee. If the track can be made to hold constant in abrading qualities, abrasion testing will have gone a long way toward the elemination of the standard. Two possibilities for overcoming the smearing of the track consist in the use of loose abrasive and in the use of a long moving abrasive tape.

Since heat is generated during abrasion testing, a variable factor in repeat tests is introduced and the committee have taken the temperature rise as their second problem. The temperature rise can undoubtedly be limited by keeping the sample in contact with the abrasive surface for only a small percentage of the time of the test.

The third problem in the present investigation consists of an effort to overcome the peculiar results obtained with undercured stocks and stocks of variable hardness, possibly by distorting the sample during the abrasion test.

Compounding of Rubber

Both experience and laboratory tests have demonstrated the high abrasion resistances that can be obtained with carbon black stocks. In some cases, however, the black color is undesirable and it becomes necessary to turn to a light colored pigment, fine particle size zinc oxide testing the most satisfactory of the pigments available at present. It is important in compounding it not to add too much softener since softeners lower the reinforcing properties greatly. On the other hand, the addition of reasonable amounts of softener to a carbon black stock does not appear to have any deleterious effect. Clays are found to be somewhat inferior to the best lithopones which are in turn inferior to ordinary zinc oxides in reinforcement. Coarse pigments such as Whiting and Barytes develop a very low abrasion resistance.

The nature of the abrasion resistance given to compounded rubber by lithopone and clay may be understood by referring back to Figure 7. A clay stock is very hard and might be represented by point "C" whereas a lithopone stock will develop less cutting resistance but greater tear resistance such as "B". A lithopone stock because of its low cutting resistance does not dull knives used in cutting it easily, and is preferable for jar ring compounds and other products that are manufactured similarly.

Abrasion resistance appears to be tied up very closely with particle size and the abrasion resistances obtained with different blacks are believed to be in line with the particle sizes with the exception of the very fine super spectra which is so fine that it has not been satisfactorily mixed in rubber.

A theory[29] has been presented that explains the reinforcement of pigments, partly on a basis of the particles acting as obstacles in the path of a tear and since there are many more particles in the case of fine pigments, they naturally reinforce to a greater extent than coarser pigments.

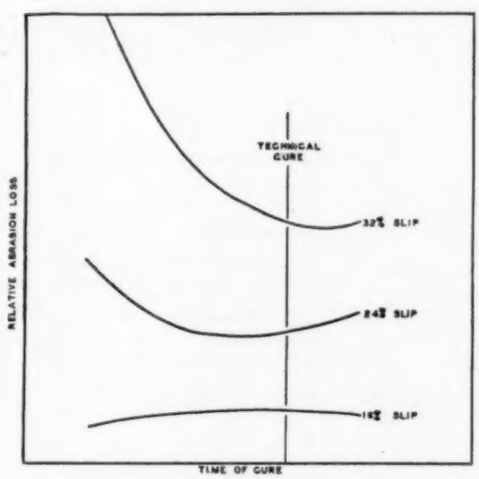


Figure 16
The Effect of Slip on Abrasion Over a Range of Cures

Not only does the choice of the pigments affect the abrasion resistance but the method of incorporating them. Tronson and Carpenter[30] have shown that if carbon black is first master batched in a rubber compound and then introduced in this form into the rubber compound, it will be enough better mixed so that the abrasion resistance of the final compound will show 20 per cent or more increase.

It has been demonstrated conclusively that the addition of reclaim[15, 31, 32, 33] lowers the abrasion resistance of high grade rubber compounds and that the amount of lowering is determined by the amount of reclaim added (Figure 17). The economic value

[28] C. O. North, *Industrial and Engineering Chemistry*, Vol. 21, page 725 (1929).
[29] Harlan A. Depew, THE RUBBER AGE, Vol. 24, page 378, January 10, 1929.
[30] *Proceedings of the A. S. T. M.*, 1931.
[31] Holt and Wormeley, Technical Paper of the Bureau of Standards, No. 294.
[32] Sanderson, *Industrial and Engineering Chemistry*, 1931, pages 989-991.
[33] W. W. Vogt, *Industrial and Engineering Chemistry*, 1928, Vol. 20, No. 2, page 140.

of the hydrocarbon in the reclaim is only about half of that of the hydrocarbon in the new rubber under the most favorable circumstances where much is used. The pigments in reclaim are bound in such a way that they have little significance in the compounding of rubber, and accordingly, analyses are of little help. Even zinc oxide, which acts in small amounts as a chemical material in activation may be ineffective when present in reclaim, due possibly to inability of the zinc soap to migrate from the reclaim to the new rubber.

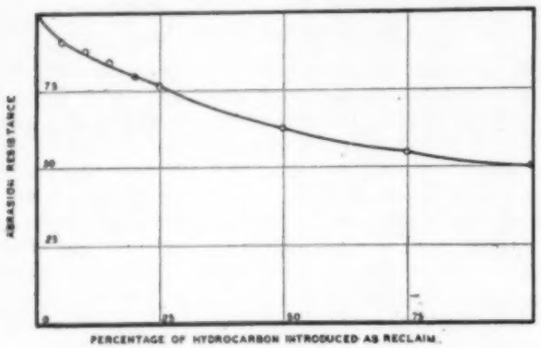


Figure 17
Evaluation of Reclaimed Rubber Hydrocarbon on a Basis of Resistance to Abrasion Using Tire Service Tests

Although the choice of the accelerator probably makes less difference in the abrasion resistance than many investigators have believed, the choice can influence stiffness decidedly. For example, mercaptobenzothiazole with zinc oxide develops a soft stock whereas the substitution of D. P. G. results in a much stiffer stock that may appear to develop higher abrasion resistances on most machines than service warrants.

There is a tendency today to use compounds accelerated with high powered accelerators that develop a low combined sulfur content but these stocks unfortunately are more susceptible to temperature extremes than other stocks, becoming hard as a board in winter, giving good abrasion resistance, and softening down at high temperatures.

Organic materials other than those added for their accelerating properties may have a profound influence on the properties of a rubber compound, and as an example, attention is called to paraaminophenol, which makes compounds with unusually high abrasion resistances both as tested on machines and in service by increasing both the tear and cutting resistance. An example is the compounding of rubber balls for the automobile drive shaft connection that is sometimes used as a universal joint. The addition of this material to Kadox stocks increased the life over one hundred per cent. Paraaminophenol ordinarily occurs comparatively coarse and it has been found desirable to grind it in a ball mill with an equivalent amount of a fine particle size zinc oxide in order to disperse it properly in the compound.

It has been charged with being so poisonous that it cannot be used in rubber compounding. Irrespective of whether it is practical for use in compounding, this material gives sufficiently unusual properties[34,35] to a rubber mix to serve to point out a kind of material that should find increased use in rubber compounding.

Some of the physical properties obtained with it are shown in Tables 1 and 2, the second formula using two accelerators to minimize any accelerating properties of paraaminophenol. It appears to cause increased stiffness and abrasion resistance with decreased elongation. Data not included in these tables also indicates improved tear resistance and anti-scorch properties. The hardness may or may not be increased depending on the formulation of the compound. In this particular case there is little difference in hardness in spite of the large difference in stiffness.

The greatest effect seems to be in highly accelerated zinc oxide stocks with a loading of about 50 per cent by weight.

In addition to the effect on the physical properties, this material improves the factory working as shown by the recovery data. It also develops improved aging and accelerating properties in some stocks.

The amount of sulfur in a stock affects the properties as well as the rate of cure and claims and counter-claims have been made for the substitution of selenium[36,37,38,39,40]. There can be little

TABLE 1

The Effect of Paraaminophenol on the Properties of a Stock Containing It

Amount of Zinc Oxide 1 *Volume*	20 *Volumes*	25 *Volumes*	35 *Volumes*
Time in Minutes to the Optimum at 141½°C.			
With	15	15	10	7
Without	15	15	15	20
Tensile Strength in Lbs. per Sq. In.				
With	4000	4220	3820	3160
Without	3625	3860	3720	3200
% Elongation				
With	755	660	630	550
Without	790	695	685	580
Load at 300% in Lbs. per Sq. In.				
With	365	1060	1080	1400
Without	300	580	695	1100
Load at 450% in Lbs. per Sq. In.				
With	735	2230	2380	2400
Without	525	1420	1670	2130
P. & J. Hardness Test—Penetration in m.m. (⅛" Ball)				
With	1.03	0.96	0.99	0.85
Without	1.20	1.39	1.39	0.87
Abrasion Resistance				
With	61	210	173	165
Without	54	145	154	165
Consistency Test (% Recovery)				
With	5.7	11.9	11.9	11.0
Without	8.5	15.9	16.4	16.9
Tensile Strength After 48 Hours in Oxygen Bomb at 70°C. With 300 Pounds Pressure				
With	3460	3600	3720	2970
Without	1690	2420	2530	2300

Formula

Rubber	100
D. P. G.	2
Stearic Acid	½
Sulfur	4
Paraaminophenol	2½
Red Label Kadox	6–213 (1-35 vols.)

TABLE 2

	Time of Cure in Mins. at 40 Lbs.	*Tensile Strength Lbs. Per Sq. In.*	*% Elong.*	*Abrasion Resistance*	*Load (Lbs. Sq. In.) for Elong. of* 300 %	450 %	*Pusey and Jones Hardness Depression ⅛" Ball*
With	5	2440	590	83	675	1460	1.60
	10	3040	605	147	920	1880	1.08
	15	3000	595	201	1010	2050	.97
	20	2970	575	244	1100	2140	.93
Without	5	2760	720	67	450	1080	1.45
	10	3260	695	134	625	1390	1.10
	15	3320	680	164	670	1560	.97
	20	3220	635	169	695	1650	.84

Formula

Pale Crepe	100
D. P. G.	0.25
Mercaptobenzothiazole	0.20
Stearic Acid	3
Sulfur	4
Kadox (Red Label)	213
Paraaminophenol	2.5

[34]Zimmerman and Cooper, *Industrial and Engineering Chemistry*, 20, 812 (1928).

[35]*The Vanderbilt News*, Vol. 1, No. 5, October, 1931, page 11.

[36]C. R. Boggs, *Trans. I. R. I.*, Vol. 2, page 272 (1926).

[37]Bierer and Davis, *Trans. I. R. I.*, Vol. 3, page 151 (1927).

[38]Twiss, *Trans. I. R. I.*, Vol. 3, page 398 (1928).

[39]W. Esch, *Kautschuk*, Vol. 10, page 285 (1927).

[40]H. Rimpel, *The Rubber Age* (London), Vol. XII, No. 8, page 288 (1931).

doubt that a selenium stock develops superior aging resistance and that the density is greater due to the greater density of selenium as compared with sulfur. As for abrasion,[41] it might be well to quote Schidrowitz to the effect that there is considerable justification for regarding selenium as a toughening agent, but that more data is needed before a conclusive decision is reached.

It is impossible to cover all possible combinations of raw materials that enter into rubber compounding, but as the experience of rubber technologists with abrasion testing broadens and confidence grows, knowledge of compounding for maximum reinforcement will increase since laboratory testing with controlled conditions gives much more information per dollar expended than service tests. Laboratory testing also permits the determination of abrasion resistance without aging becoming a factor when it is so desired which in turn gives a more helpful picture of the value of the compounds under investigation.

Consumers find it relatively easy to determine whether tire manufacturers are building resistance to abrasion into tires and accordingly there has been a great incentive to make abrasion studies on tires. Furthermore, the dollars and cents value of tires has been so great that the expenditure of considerable sums of money has been justified, even to the extent of large test fleets of cars. The importance of abrasion resistance studies is of relatively as great importance to the small manufacturer engaged in making rubber mats, for example, as to the tire man and although abrasion studies may not save as large sums of money for him as for the tire manufacturer, the percentage saving may be greater. The present period marks the beginning of a wider use of performance[42] tests; direct easily understandable tests, such as abrasion tests, will be found to be increasingly necessary.

[41] *India Rubber Journal*, Vol. LXXVI, No. 11, page 383 (1928).

[42] A. W. Carpenter, THE RUBBER AGE, Vol. 29, No. 11, page 502 (1931).

ERRATA: In the first instalment of the above article, appearing in the February 10th issue, the cut used as Figure 4, through error, was reversed. Correctly placed, the upper right hand corner of the cut should have been the lower left hand corner.

America's 1931 Tire Trade

UNITED STATES exports of pneumatic tires for trucks, busses, and other automobiles during 1931 amounted to 1,954,865 casings, a decline of 27 per cent from the 2,680,573 total of the year before, according to Department of Commerce reports. Th dollar value of these shipments fell off more sharply than did the volume, dropping by 33 per cent—to $19,676,519 from $29,444,527.

A number of factors—apart from general adverse conditions—brought about the decrease in exports of tires. In the first place, sales of automobiles to persons not previously owning a car, for instance, dwindled to insignificant proportions in many markets, while renewal purchases were delayed as long as possible. In addition, many car owners whose vehicles are still far from the scrap heap have been forced to remove them temporarily from service.

The year 1931, also, witnessed further development of the branch factory abroad. In the case of tire exports to Argentina, for example, that country in 1930 was by far the largest consumer of American tires. During 1931, however, the branch factories of two large American producers went into quantity production—resulting in a 78 per cent decrease in the number of tires shipped from the United States, and Argentina's decline to the thirteenth place on the list of our foreign markets.

During 1930 British India took 110,443 truck, bus, and other American automobile casings. A 47 per cent increase raised this total to 162,985 in 1931, owing partly to the growing favor with which American cars are regarded in that country, and partly to the rapid growth of trucking and the development of busses. Although second to Denmark as a purchaser of other American automobile casings, India took almost as many truck and bus casings as the next two largest markets combined, increasing by 62 per cent over the year before to a total of 59,755 casings. India's climate and the lack of paved roads tend to shorten tire life.

Cuban Tire Market

ALTHOUGH in some respects the situation in the Cuban tire market was better at the close of 1931 than at the end of 1930, sales of both pneumatic and solid tires dropped during the year, according to reports of the Department of Commerce. Imports of pneumatic tires to Cuba during the first eleven months of 1931 totaled 69,280, as against 127,130 in the corresponding period of 1930, a decline of 45.5 per cent.

Michelin and Dunlop Competition

The Dunlop and Michelin are the only European tires represented in Cuba. The former company is a member of the Rubber Export Association and, therefore, is obligated to adhere to the prices established by this organization in Cuba. As long as the Dunlop Co. remains in the association there is no likelihood that it will attempt to take advantage of the depreciated British exchange and cut tire prices in Cuba. The fact that some American companies also maintain factories in England would tend to discourage this operation, inasmuch as the American companies would be on an equal footing with the Dunlop Co. and would be in a position to meet any price reduction which might be offered. It is the general opinion that the tariff preferential given to American goods entering Cuba, combined with the volume of production facilities of American manufacturers, more than counteracts any advantage which might be obtained through the depreciation of sterling exchange. It is, therefore, felt that American products will not be affected by this development.

The Michelin competition increased in 1930 as compared to 1929, but the gain of 1930 was completely lost during 1931. During 1929, 3.8 per cent of the total pneumatic-tire imports were of Michelin tires. In 1930 this ratio increased to 6.1 per cent, but during the first 11 months of 1931 Michelin tires accounted for only 3.4 per cent of the total. Dunlop tires have lost ground steadily during the past three years. The imports during 1929 of Dunlop pneumatic tires represented 8.1 per cent of the total; in 1930, 6.7 per cent; and in the first 11 months of 1931, only 5.7 per cent.

Improvement in Market Expected

It is the general impression among the tire importers that 1932 will show some improvement in the demand for pneumatic tires over 1931. It is the feeling among some that imports will show a gain of from 10 to 15 per cent over those of 1931, thus bringing the average imports to approximately 7,000 units per month. In the case of solid tires, however, a further decline is expected, and it is doubtful if the average monthly imports will exceed 125 units. The favorable factors in the Cuban tire situation include the reduced stocks in the hands of dealers and the virtual consumers' strike which has existed for nearly a year. Much of the equipment now in use is in such bad shape that it will have to be replaced at an early date if the cars are to be used.

The unfavorable financial condition of dealers is, of course, serious and will in part counteract the favorable factors. The importers are finding it necessary to exercise great caution in granting credits, if losses are to be avoided. Numerous dealers are in such precarious condition that they are not expected to continue throughout 1932 unless a definite improvement in the general business situation occurs. Another unfavorable factor is the reduction in car registrations which has occurred during the present fiscal year.

EDITORIAL COMMENT

Rubber—A Paradox

THE rubber industry has had the habit, periodically, of upsetting all economic theories, at least for a time. The law of supply and demand seems to be entirely a stranger to rubber as a raw commodity. Nor does the law relative to low prices effecting production appear to be applicable in this case. In the face of a greatly decreased consumption rate, which was perfectly obvious during the entire year of 1931, production at a high rate continued and even exceeded that of the previous year. In spite of declining market prices, even reaching below the cost of production, tapping continued and crude rubber in surprising tonnage came from the producing centers to glut the chief consuming markets. World production of crude rubber last year exceeded consumption by approximately 130,000 long tons, and that in spite of two full years of a constantly declining market and a definite knowledge that consumption, in view of the world-wide depression, would in no way come up to previous absorption totals.

There is evidence that estate production increased more than normally over months immediately preceding in September, October, and November both in Malaya and Ceylon, according to reports of the Department of Commerce. In Malaya, the production of small holders increased in these same months at a more rapid rate than the production on estates over 100 acres, and a comparison of production on 102 estates in Ceylon with total Ceylon exports shows that producers not included in the 102 estates increased their production more than those estates. These indications point to the possibility that native producers, reacting more quickly than large estates to short term market influences, will be likely to increase their output on even slight price increases, while estates, if they once reduce operations, will not resume until certain of ability to work profitably.

It is an astonishing fact that rubber production and export statistics have reflected so little the current depression. The statistics of trade volume have held up steadily and during the last quarter of 1931 reflect increased outputs for Malaya and Java as compared to 1930, while for Ceylon they show a greater than normal increase over 1931. In the case of Java, exports during November were an all time high record except for the preceding month of October, and exports from Java during the last half of 1931 exceed the first half.

Rubber, during 1931, fulfilled its role as a paradoxical raw commodity.

1931 Census of Manufacturers

RUBBER plants of all kinds are urgently requested by the Bureau of the Census to fill out and return promptly their 1931 Census of Manufactures questionnaires. The Bureau is making a special effort to conduct this canvas by mail. If that can be done it will materially reduce the cost of the work, by obviating the necessity of sending special agents to get the information which rubber plants can and should furnish by mail.

The questionnaire being used in the current census is shorter than the one at the preceding census, and the inquiries are simple. It is believed that, as a rule, rubber plants will have little difficulty in supplying from their books the figures requested. As the census law makes it the duty of all those coming within the scope of the census to supply census data, delay in filling out the questionnaires is of no advantage.

The census statistics are compiled primarily for the purpose of showing the absolute and the relative importance, the growth or decline, and the geographical distribution of rubber plants. The reports of the census constitute one of the chief sources of statistical information on rubber plants. The value of any statistics of current conditions, whether industrial or other, is obviously dependent to a large extent on the timeliness with which they are issued. Unless they are made available before any considerable changes have occurred in the field canvassed, their value becomes chiefly historical.

The rubber industry appreciates the value of timely statistics from the Bureau of the Census. In order that such statistics may be available it is incumbent on each plant to prepare and return a report promptly. The promptness with which statistics can be compiled and published depends chiefly on the completeness and accuracy of the returns and on the promptness with which they are prepared and sent to the Bureau.

The RUBBER AGE

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Representatives in all the rubber centers of the United States, Canada, England, France, Germany and the Middle East.

The Rubber Industry's CURRENT NEWS

Financial—Personals—New Rubber Products—
Building Operations—Manufacturing—Exports

AKRON TIRE PLANTS SPEED UP ACTIVITIES

Reports are persistent that the tire factories in the Akron district are revamping production schedules in anticipation of increased demands. Activity is also centered in the development of the new model tires, particularly the "doughnut" types and it is reported that good sized orders for new mold equipment and other machinery incident to the manufacture of tire lines have been recently placed with rubber machinery concerns.

Two of the larger Akron tire factories have been put on a 24-hour basis—Goodyear and Goodrich—and a few of the old employees now on furlough have been recalled for work.

Several Akron mold and machine companies are at work on molds for extreme low pressure casings and tubes, furnishing additional work for unemployed machinists.

Goodrich is reported to have spent over $1,000,000 on development of its new "safety Silvertown" balloon tire, in addition to its low pressure type now going on the market.

Mohawk Plan Approved

At the annual meeting of the stockholders of the Mohawk Rubber Company, February 8, the directors reported satisfactory progress during 1931 and greatly improved prospects for the ensuing year.

The shareholders approved an agreement between bankers and directors of the company for refunding bank indebtedness nad bonded debts on a sliding scale of retirement during the next seven years.

As the 1931 audit was incomplete the meeting was adjourned until March 15, at which time the report will be received.

All officers and directors were re-elected, including C. Borland, president; J. B. Huer, vice-president; G. W. Spahr, vice-president in charge of sales; R. E. Block, secretary-treasurer, and L. P. Noel, assistant secretary. Directors are: R. H. Bishop and W. L. Flory, Cleveland; C. Borland, S. S. Miller, and J. B. Huber, Akron.

Thermoid Shows Profit

Report of Thermoid Rubber Company, Trenton, N. J., and wholly owned subsidiaries for year ended December 31, 1931, shows profit of $163,413 after depreciation, interest, etc., no mention being made of federal taxes. In 1930, company reported profit of $380,765 after depreciation, interest, etc., but before federal taxes.

Pharis Goes on Full Time

The Pharis Tire and Rubber Company, Newark, O., which has been working with a reduced force for the last two months, is calling back all furloughed men and will immediately go on a three shift full-time schedule, with a maximum of 750 employees. Officials of the plant state that the new plan is the result of orders on hand and that this full rate of employment is expected to continue, at least, throughout the summer.

Goodyear Interplant Conference

Interplant conferences of Goodyear Tire and Rubber Company factory executives were held in Akron during the early part of the month and terminated February 5, after a session at the factory.

C. C. Grant, manager of the engineering department, had general charge of the meeting.

Goodyear managers and heads of departments from other Goodyear plants in Los Angeles, Wolverhampton, Eng., Canada and Gadsden, Ala., were here for the conference.

RUBBER MEN IN THE FAR EAST FIGHTING ZONE

PARK BRYAN, special representative of the Goodyear Tire and Rubber Company, has been in Shanghai with his wife since 1927.

P. J. PRINS, manager of the Firestone export sales in the Far East, sailed from San Francisco on January 1, with his wife and was to have landed in Japan late in the month and then proceed to Shanghai, but no word has reached the Akron Firestone office from him and it is presumed that he is still in Japan.

W. A. WYMER, F. P. CASE and R. W. HADLEY are the resident representatives of the Goodyear Tire and Rubber Company in China. No reports have come from them that they are in any danger.

Cablegrams received by Firestone Tire & Rubber Company from their representatives in the Shanghai area, indicated that so far there had been no damage to the company's property but described the situation as "serious and obscure."

Samuel Broers, head of the export division of Firestone, said that he regarded the plight of the representatives of the Akron rubber companies in the troubled area was precarious but not dangerous.

SCRAP RUBBER DEALERS TO HOLD ANNUAL MEETING

Part of the program of the 19th annual convention of the National Association of Waste Material Dealers will include several sessions of the Scrap Rubber Division of the Association. The convention and a banquet following will be held at the Hotel Astor, New York City, March 14-16. Herman Muehlstein, president of H. Muehlstein & Company, New York, heads the scrap rubber group.

The banquet committee of the Association is planning to make all members forget the depression for at least one evening. The occasion on the evening of March 16 promises to be a bright spot in a heretofore dull year.

Major General Smedley D. Butler, whose spectacular career for more than thirty years in the United States Marines, is well known, has accepted an invitation to address the members of the Association and their guests at the banquet. General Butler is always interesting because he has interesting things to say and says them in an unusual way.

His experience as head of the police department for two years in Philadelphia, and his experience of over thirty years with the Marines assures a very interesting address for the members of the Association. It was Lowell Thomas who characterized him as a "stick of human dynamite" and with conditions as they are at present in the Far East, the general is likely to step right out and call a spade a spade.

U. S. Rubber Imports, 1931

A few tabulations, showing the importations of specific rubber goods into the United States during 1931 have been released by the Department of Commerce. They show that only 13,213 automobile casings entered the country last year, at a total value of $74,084. Over 9,000 of these came from Canada.

A total of $156,176 worth of rubber toys, including toy balloons were imported, the majority coming from Japan with Germany a close second.

Imports of druggist's rubber sundries a total of $166,319 worth entered the country, approximately half of which came from Germany.

Explosion Fatal at St. Clair

Two men died and one is believed fatally burned as the result of an explosion recently at the plant of the St. Clair Rubber Company, Marysville, Mich.

RUBBER MEN TO BE AT SAFETY MEETING

The All-Ohio Safety Conference Program, which starts at Columbus, O., on April 10 and ends April 16, calls for papers from the following prominent rubber safety men from the Akron district:

D. E. STRATTON, foreman, shoe department, Miller products division of B. F. Goodrich Company; H. A. WALKER, employees' service division, Goodyear Tire and Rubber Company; C. L. HUNGERFORD, Firestone Tire and Rubber Company; B. F. GERPHEIDE, Goodyear Tire and Rubber Company, and J. C. LEE, India Tire and Rubber Company.

A. C. & Y. Tests Rubber Wheels

Akron, Canton & Youngstown Railroad have begun experiments with a rail automobile equipped with the new steel flanged rubber tires, introduced recently into this country by the Michelin Rubber Company of France.

An experimental run of a "rail sedan" from Akron to New London, O., a distance of 52 miles was made in 55 minutes. The experiment was the second of its kind in America. Its further success might lead to the use of motor-equipped, rubber-tired passenger and baggage coaches, A. C. & Y. officials indicated.

The steel-flanged tire for railroad uses was first proved successful in experiments on the French Railways. Its first application to American rolling stock was a few weeks ago by Budd Wheel Company, of Philadelphia, which equipped a 20-passenger coach for rail use.

Seiberling Rubber Company is reported to be experimenting with the rubber railwheel locally.

Rubber Below Four Cents

A contract calling for delivery of standard ribbed smoked sheet crude rubber changed hands on the Rubber Exchange of New York, Inc., on February 8, at 3.92 cents, a new all-time low for the American market, and 8 points below the short-lived record established on February 3, last. The price was paid on the February delivery.

New developments of any favorable character to rubber were lacking. The London market was unchanged from Saturday and the Singapore market was suspended in observance of the Chinese New Year.

Stocks of crude rubber in Far Eastern dealers' hands increased from 50,721 tons, dry weight basis, at the end of December, to 52,723 tons at the close of January. Such supplies last year totaled 42,202 tons.

Sales Conferences in Dramatized Form

THE B. F. Goodrich Rubber Company at its annual sales and advertising conferences in five major distribution centers of the country during February, dramatized a portion of its conference to present to its salesmen concrete facts to assist in solving field problems.

A staff of eleven Akron sales and advertising employees under the direction of Joseph Rothman and A. J. Finkle of Caravel Pictures, Inc., New York, dramatized the policies at conference sessions held in Atlanta, New York, Akron, Chicago and Los Angeles.

The presentation opens with Nate Johnson, small town dealer, attempting to escape the scathing remarks of an irate customer. As he attempts to pacify the dissatisfied customer he further involves the situation.

The entire first act is devoted to unplanned selling, lack of systematized records and an example of jagged business from standpoints of both the dealer and the manufacturer.

The dismal store in the second act is the background for the trained Goodrich salesman who demonstrates to the conference group the use of selling devices and planned methods.

The third and final act shows the Goodrich-ized tire store, properly identified merchandise properly displayed and a thoroughly trained staff of salesmen. Serious phases of sales presentation are broken by humorous situations characteristic to the retail tire sales field.

Scenes from the Goodrich Sales Conference Play

BETTER OUTLOOK VOICED BY GOODRICH OFFICIALS

INCREASED prices of merchandise, better products, new developments and a marked increase in the general business curve are predicted for the rubber industry in the coming year by B. F. Goodrich Rubber Company officials who held their annual sales and advertising conference in the Pennsylvania Hotel, New York City, February 7-9.

"Because the resources of rubber and cotton growers will prevent additional reductions or sustained low prices in those commodities, it is believed that rubber products will increase in retail price within the next several months," S. B. Robertson, vice-president and general manager of the Goodrich company, stated while here for the conference.

"Although we talk about depression, we find that merchandising methods, quality products to meet the demands of modern improvements in every line of industrial endeavor will assist recovery. The rubber industry is no exception and general business should share this anticipated advantage."

New products introduced at the Goodrich conference indicate to a large extent the advancement in recent months of the automotive industry.

C. B. O'Connor, general tire sales manager of the Goodrich company, pictured the future of the rubber industry as related to the automotive industry as a whole.

"From recent announcements of automobile manufacturers it is apparent that 1932 will see many innovations in that industry," O'Connor said.

"More perfect stream-lining, more powerful motors for increased speed, more comfortable vehicles, beautiful colors, free-wheeling, better brakes, silent operation and attachments for convenience as well as utility already are facts. It is necessary that the rubber industry play its important part in every one of these phases of automotive development.

"Beauty is important and for that reason the tires and other rubber parts contributing to the decorative aspect of the automobile must meet present-day advancements. Goodrich introduced for the first time colored automobile tires. Twelve shades will be custom-built for discriminating automobile owners. Red, green, brown, yellow and silver are the outstanding colors making up the various shades. The colors are welded into the rubber by a secret process and will not wear off with hard wear.

"Tires must be better to withstand quick starting, sudden stopping, constant hammering on the road and higher speeds. Goodrich recently introduced the new Safety Silvertown, a tire with heavier tread, deeper tread design to prevent skidding, wider traction surface and a greater wear-resisting tread compound, all of which combine to give the motorist longer service with greater safety."

Low-pressure tires for automobiles are gradually appearing throughout the country. Goodrich displayed the new Silvertown super-cushion tire, which it is predicted will have wide and immediate acceptance.

NEW JERSEY RUBBER PLANTS MORE ACTIVE

The Neptune Rubber Manufacturing Company, of Irvington, N. J., announces that it will shortly close its factory at that place and remove to a plant at Trenton, N. J. Seth R. Mulburry, president of the company, is having the Trenton plant prepared for the installation of new machinery and equipment. The company manufactures moulded rubber novelties and rubber bathing slippers and caps.

Young's Rubber Corporation of New Jersey, Trenton, N. J., which recently suffered a severe loss by fire, is having the damaged building repaired. In the meantime manufacture of specialties is being carried on in another part of the factory.

Hamilton Rubber Company, Trenton, N. J., is having a one-story addition, 25 by 34 feet, erected. Luzerne Rubber Company, Trenton, is erecting a one-story warehouse.

Essex Rubber Company, Trenton, N. J., is one of the few New Jersey rubber concerns operating full time. A number of old employees have been given positions.

Goodyear Film Service

Attendance at showings of Goodyear movie films reported by borrowers of the reels reached a total of nearly one and a half million persons during 1931.

From a film library of 31 subjects people from all over the United States and some from Canada borrowed the films, showed them and returned them without charge, excepting payment of the return postage. December borrowers broke all records for a single month, when 585 films were shipped from the Goodyear factories at Akron and Los Angeles.

Churches, schools, colleges, universities, fraternal organizations, Boy Scout troops, American Legion posts, homes, factories, Y. M. C. A. meetings are all constant users of the library which includes such subjects as the construction and flights of the *U.S.S. Akron;* rubber and cotton plantation processes. Boy Scout tours; balloon racing and the story of the tire.

Goodyear maintains its own motion picture laboratory completely equipped for the taking and developing of movies and making of hundreds of prints.

Rodenbough Makes Change

Anouncement was recently made that I. S. Rodenbough, well-known in crude rubber circles and formerly of the firm of Herron, Rodenbough and Meyer, has become a member of the firm of Pusinelli and Poel, Inc., New York City. At the same time it was announced by his former connection that their firm name would be changed to Herron and Meyer, in consequence of Mr. Rodenbough's retirement.

Philip Billhardt will be the member in charge of the New York office of Herron & Meyer, with E. T. Meyer at Chicago, and J. W. Herron directing activities at Akron, Ohio. Mr. Billhardt also will continue, on his own account, to represent the remilling and rubber shipping company of Sing Seng Moh and Company, Singapore.

Names in the News

HARVEY S. FIRESTONE, SR., left Akron recently for Miami Beach, Fla., with a party of nine Firestone executives and their wives. It is customary for a number of company executives to annually visit the Florida home of the Firestones. Mr. Firestone, Sr., expects to remain in Florida for the next month.

HARLAN A. DEPEW, formerly chief of the rubber research of the New Jersey Zinc Company, at Palmerton, Pa., has accepted a research position with the American Zinc Sales Company, Columbus, O.

Mr. Depew has long been active as a member of the Rubber Division of the American Chemical Society and of Committee D-11 on Rubber Products of the American Society for Testing Materials. In the latter group, he has given much effort to his work as chairman of Subcommittee XIV on Abrasion Tests for Rubber Products.

HARLAN A. DEPEW

The addition of Mr. Depew to the staff of the American Zinc Sales Company permits a further expansion of their research and technical service on zinc pigments.

SEWARD G. BYAM, who for about ten years was chief chemist of the rubber products plant of E. I. DuPont de Nemours and Company, Fairfield, Conn., and more recently in charge of development of new uses for rubberized fabrics, at the Fabrikoid division of the Company, has been transferred to the Rubber Chemical Division, at Wilmington, Del. Prior to his connection with the DuPont organization, Mr. Byam was factory manager, for several years, of the Plymouth Rubber Company, Canton, Mass.

H. J. MOREHEAD, formerly B. F. Goodrich Company retail stores superintendent in the Philadelphia territory, has been appointed manager of railroad sales, according to recent announcement by C. B. O'CONNOR, general manager of tire sales of Goodrich. Mr. Morehead's headquarters will be in Akron.

D. F. CRANOR, manager of the service and control division of Binney and Smith Company, New York City, was the principal speaker at the regular meeting of the Chicago Paint and Varnish Production Club, on the evening of February 15, at the Medinah Athletic Club. Mr. Cranor spoke on carbon black, illustrating his talk with moving pictures.

RALPH S. LEONARD, treasurer of Firestone Tire & Rubber Company, Akron, O., was elected president of the University Club of Akron, at a meeting and dinner of the directors held recently.

DR. KARL ARNSTEIN, vice-president and chief designer of the Goodyear-Zeppelin Corporation, has returned to Akron after a trip to Germany, where he inspected the construction which is progressing on the LZ-129, the new commercial dirigible of Dr. Hugo Eckener. He will be actively engaged for some time in the construction of the new ZRS-5, the new companion ship of the *U.S.S. Akron,* which is being built for the United States Navy.

W. C. YOUNG, manager of Goodyear's aeronautical department, spoke recently at Niagara Falls, N. Y., before officials and others of the Carborundum Company, on the subject of "Air Transportation."

CHARLES R. WETSEL, who for 20 years has been an executive of the Miller Rubber Company organization, has been named assistant to W. P. CLINE, treasurer of the Master Tire & Rubber Corporation, Akron, O.

EVERETT MORSS announces the change of his office address to 79 Sidney Street, Cambridge, Mass.

CHARLES S. GLICKMAN has joined the laboratory staff of Glyco Products Company, Inc., Bush Terminal, Brooklyn, N. Y., where he will devote his time to special emulsion work for the rubber and other industries.

CHANGES IN PERSONNEL AT GOODRICH COMPANY

FRANK T. TUCKER, former advertising manager of Goodrich Silvertown, Inc., has been appointed advertising manager of the Goodrich tire division, according to an announcement by P. C. HENDERSON, advertising director. J. J. COCHRAN and A. H. ROTH become assistant advertising managers.

Other changes in the personnel of the tire division include: HAROLD GRAY, new manager of compounding and developing; W. H. ELLIOTT, manager of construction and design; C. W. BEDFORD, manager of compounding and construction research, and H. W. DELZELL, manager of technical service.

· Rubber News Around the World ·

GOODYEAR OF CANADA MAKES GOOD SHOWING

The annual report of the directors of the Goodyear Tire and Rubber Company of Canada, Ltd., and subsidiaries, as presented to the stockholders by C. H. Carlisle, president of the company, on February 10, showed the concern to be in the strongest financial position in its history. The report covered fifteen months ended December 31, 1931, the new closing date for the company's fiscal year, and showed a net profit of $1,702,986 after taxes, depreciation, etc., and after writing down all manufactured goods, goods in process, materials on hand and future commitments to market prices as of December 31, last. This is equivalent after dividends paid on 7% preferred stock to $8.24 a share on 128,630 no-par shares of common stock. In the year ended September 30, 1930, company reported net profit of $1,550,404, after depreciation, federal taxes, etc., equivalent after preferred dividends to $8.01 a share on the common stock.

Total current assets amount to $10,479,158 as compared with current liabilities of $420,280, a ratio of twenty-five to one. Net current assets or working capital have been increased by $915,379 and net additions to plant and equipment during the year amounted to $283,745.

"Each year shows your company in a stronger financial position, not only adding to surplus, but in the cancellation of the number of shares outstanding," stated Mr. Carlisle, in his report to shareholders.

"Owing to disturbed world conditions, it is useless to predict the outcome of your company's present year's business, but because of its strong position, it should be able to secure its full share of whatever business is available."

Schonning & Arve

At a recent meeting of the Danish rubber company, Schonning and Arve, in a discussion of the annual report for the year ending August 31, the chairman of the board of directors stated that despite increasingly keen foreign competition and evident price cutting, the past year was considered favorable, with a turnover of 3,000,000 crowns, compared with 3,600,000 crowns during the year before. (Crown, approximately $.25 U. S. Cy.).

The chairman also stated that the future outlook is not very bright and that sales depended largely on competition abroad.

British Tire Exports

Exports of automobile casings from the United Kingdom, during the calendar year 1931, showed an appreciable drop, totaling 1,166,792 as compared with 1,385,286 for the corresponding year 1930. In value the 1931 shipments amounted to $2,456,186.

New Zealand proved to be the leading British tire customer, taking a total of 134,614 casings. Irish Free State, France and British India came next.

Romney Carries All-Rubber Cargo

It is announced by A. Barbour & Co., Singapore rubber dealers, that the S.S. *Romney*, a "non-conference" vessel chartered by the firm to take a record cargo of 8,000 tons net of rubber to New York, sailed from Penang on February 1.

The entire cargo of rubber was sold in New York before shipment.

Considerable feeling has arisen in Singapore from the action of Barbour & Co. in chartering steamers privately to take rubber abroad at reduced rates. The reduction in the freight rate on rubber recently announced by the Shipping Conference is generally held to be the Conference's reply to this action.

British Test Rubber Rail Tire

An adaptation of the Michelin railcar has been brought to Britain from France and is to be given a careful test on the London, Midland & Scottish Railway, the biggest railroad system in the British Isles. The car is a long 10-wheeled vehicle about the size of a large road coach, with a 20 h. p. engine. The tires are about the gauge of those of a small automobile and are fortified with an inner hoop of wood. The wheel rims are fitted with a steel flange on the inner side to keep the wheel on the rails.

Unlike the Ro-railer, another pneumatic-tired rail car in which this railroad is interested, this is a rail car exclusively and cannot be used on roads. It is designed for use on secondary lines, and when tried in France covered the 138 miles from Paris to Deauville in 2 hours, 14 minutes—21 minutes faster than the fastest train in regular service. It accelerates and stops as quickly and easily as an automobile.

U. S. Exports, 1931

The Department of Commerce has announced the following preliminary figures showing the exports of various classes of rubber goods during 1931. The figures are stated to be subject to revision.

Rubber Belting, lbs.	3,285,527	$1,431,178
Rubber Hose, lbs.	5,104,272	1,497,428
Rubber Packing, lbs.	1,343,246	552,385
Rubber and Friction Tape, lbs.	1,150,128	303,460
Rubber Proofed Auto Cloth, sq. yds.	963,401	414,817
Rubber Piece Goods and Hospital Sheeting, sq. yds.	1,247,063	489,524
Waterproof Outer Garments, no.	328,580	617,491

The United Kingdom took the greater share of rubber belting and hose of any individual market, while Canada was our best customer for rubber packing. The United Kingdom was also the leading purchaser of the last three items listed.

CANADIAN EXPORTS SHOW BIG DECLINE

Exports of tires from Canada during 1931 showed a severe drop, totaling only 741,804 pneumatic casings as against 1,376,048 in the calendar year of 1930. Shipments of inner tubes also declined sharply, totaling 553,813 tubes as against 1930 shipments of 1,211,042. British South Africa continued to be the leading market, with Denmark, Belgium and Brazil the next important outlets in the order named.

While Canadian exports of rubber boots and shoes also showed a decrease, it was not as marked as in the case of tires. Shipments numbered 1,529,664 pairs, valued at $2,215,356, as compared with 1,729,563 pairs, valued at $2,742,687 in 1930. The drop in canvas rubber-soled footwear was more pronounced, total shipments amounting to 3,391,664 pairs valued at $2,192,767 as against 6,168,128 pairs, valued at $4,339,998 during the calendar year of 1931. Canada's best market for footwear was the United Kingdom.

Canadian rubber belting exports during the calendar year 1931, totaled 902,522 pounds valued at $269,031, as compared to 1,374,222 pounds valued at $490,299 in the calendar year 1930. Canada exported $124,556 worth of rubber hose in the calendar year 1931 as compared to $211,587 worth in the calendar year 1930. The United Kingdom was again the best Canadian market for these mechanical goods.

Belgian Factory in Germany

In January, 1930, the firm of O. Englebert Fils & Cie, Brussels, one of the leading European tire manufacturers, established a branch factory at Aachen (Aix-la-Chapelle) for the purpose of extending its business in Germany.

The plant was ready for operation at the end of 1930. The manufacturing program includes automobile, motor cycle and bicycle tires and tubes. Motor cycle tires hold the greater share of the total production, followed by bicycle tires and automobile tires, in the order named. It is not believed that sales of Englebert tires in Germany have increased since the establishment of the plant at Aachen. The stagnation of business, however, is attributed largely to the unfavorable economic conditions. Several types of automobile tires are still imported from Belgium. The present output of motor cycle and automobile tires is estimated at from 8,000 to 10,000 pieces per month, while the maximum monthly output of bicycle tires is stated to be 30,000 pieces. At present only 200 workmen and 180 employes are employed. The production capacity of the plant, however, requires the employment of 1,000 workmen. All raw materials used in the Aachen plant are supplied by the parent establishment.

While sales are made principally in Germany, the company also does some export business.

Restriction Talks Continue

No final decision has been made in negotiations between Great Britain and Holland for a plan to regulate the production of rubber, according to a recent announcement by the Dutch Colonial Minister, Dr. De Graaf, in the first official statement issued by the Dutch government on the present negotiations.

"Reports circulated concerning the Dutch government's intention respecting restriction of rubber production, however, are premature.

"In a memorandum replying to the preliminary report of the lower Chamber on the budget of the Dutch East Indies government, the Colonial Minister states that no final decision can be taken at the present stage of the negotiations.

"The restriction question has been further discussed by him and the Dutch East Indies government following the conferences held in London last December."

New Jersey Zinc Report

Report of New Jersey Zinc Company for year ended December 31, 1931, shows net income of $3,051,589 after depreciation, depletion, taxes, etc., equivalent to $1.55 a share (par $25) on 1,963,264 shares of stock. This compares with $5,013,403 or $2.55 a share in 1930.

Net income for quarter ended December 31, 1931, was $546,751 after charges and taxes, equal to 28 cents a share, comparing with $778,817 or 39 cents a share in preceding quarter and $873,367 or 44 cents a share in fourth quarter of preceding year.

Tire Company is Sued

Charging they were fraudulently induced to cancel notes amounting to $437,780.77, five former stockholders of the defunct Columbia Tire and Rubber Company of Mansfield, Ohio, recently filed suit to collect $788,606.30 damages from four former directors of the concern.

Rubber Stock Quotations

	Last Price		—1932—	
	Feb. 18	Feb. 4	High	Low
Aetna	—	3	3	1¾
American Hard Rubber	—	—	—	—
Faultless	—	25	25	25
Firestone	12⅝	—	15	12
do. 6% pfd.	54½	54	59½	50¾
Fisk	¼	⅛	⅜	⅛
do. 1st pfd.	½	⅜	⅞	¼
General	49¾	49¾	49¾	49¾
do. pfd.	60	—	—	—
Goodrich	4¼	4	5⅝	3⅞
do. pfd.	16	15½	17	12
Goodyear	16½	15	17¼	12⅞
do. 1st pfd.	54	—	56¼	43
India	7	—	—	—
Intercontinental	—	—	—	—
Kelly-Springfield	2	1¾	2⅛	1
do. 6% pfd.	29¾	30	32	20
Lee	—	2	2⅛	2
Mohawk	2	2¼	2½	1
do. pfd.	20	—	—	—
Norwalk	—	1	—	—
Pirelli	30⅞	—	30⅞	26⅞
Raybestos-Manhattan	10⅞	10¾	11½	9⅞
Seiberling	4	4	4½	4
do. pfd.	20	—	—	—
Thermoid	2½	—	3	2
U. S. Rubber	5	4	5¾	3½
do. pfd.	9	8¼	10¾	7½

New Rubber Goods

"Sel-Flate" Safety Vest

A safety vest for any emergency in connection with aquatic sports is the latest product of the Hodgman Rubber Company, Framingham, Mass. It is sold under the trade name of "Sel-Flate" and is worn flat to the body like an ordinary vest. In the event of danger, a quick, easy pull downwards on the trigger cords and the vest inflates instantly. The collar arrangement, as shown in the accompanying illustration, is designed to support the head and keep it above water. Its construction is a heavy

Sel-Flate Vest

rubberized jeans fabric in olive drab color, with seams molded and vulcanized. It is operated by triggers similar to rifle triggers and the buoyancy is supplied by the discharge of carbon dioxide into the vest from two dischargers located at the bottom. An auxiliary mouth valve gives an additional margin of safety. The manufacturers claim its successful use by the Army Air Corps, U. S. Navy, and the Coast Guard.

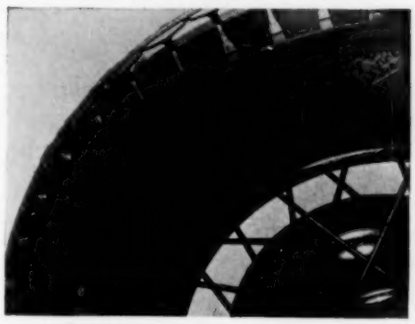
Over-Slip on Heating Pads

A moisture-proof over-slip of rubberized fabric is now being supplied with all Universal Thermostat heating pads manufactured by Landers, Frary & Company, New Britain, Conn. This rubberized envelope

Thermostat Heating Pad with Rubber Overslip

buttons over the pad securely so that no moisture reaches the heating pad. In the Universal Pad there are four non-radio interfering thermostats, regulated by switch, which automatically maintains heat at three different intensities, according to the requirement of the user.

Colored Tires



Section of the New Goodrich Tire With Colored Sidewalls to Match the Body Color Scheme of Automobiles

Gym Shoe for Women

Servus Rubber Company, Rock Island, Ill., are now producing a new model "Phog" Allen gym shoe for women. The shoe is the result of an increasing demand from

Servus "Phog" Allen Gym Shoe for Women

women athletes for a sport shoe which would be especially built for them along feminine footwear lines, embodying beauty as well as utility. The new gym shoe has been designed by Dr. Forrest C. Allen, director of physical education and basketball coach, at Kansas University.

Rubber-Backed Rug

The Shelton Looms, owned and operated by Sidney Blumenthal & Company, 1 Park Avenue, New York City, are marketing a new sponge rubber-backed rug, under the trade name "Shelton rug," designed for use in boudoirs and bathrooms. The non-slipping feature of the sponge rubber back of the rug on wet or highly polished floors is a safety factor as well as the fact that in the bathroom the rubber provides an insulation against the possible accident of bathers making an electrical contact with a light switch and the wet floor.

The resiliency under foot and the ease with which the rug can be washed are additional features of the new rug. The rugs are being offered in pastel colorings and designs.

Edison Holiday Suggested

While enroute to his winter home in Florida, Harvey S. Firestone, Sr., stopped over in Washington on February 11, to see President Hoover and urge the observance of that day hereafter in commemoration of Edison's birth. Henry Ford, the other member of the famous triumvirate, has previously suggested that the day be observed as "do the best you can day."

INQUIRIES FROM READERS

(Address replies to the Editor, THE RUBBER AGE, *250 West 57th Street, New York City, N. Y., mentioning inquiry number.)*

Rubber Suspension for Automobile Wheels

British concern holding patents on novel four wheel suspension and stabilized steering is desirous of getting in touch with American rubber or automobile manufacturers. United States patents issued. Inquiry 22532-A.

Repair Rubber and Low Priced Tires, Tubes and Patches

Inquirer desires contact with manufacturer of repair rubber for use in tube repair kits, also low-priced unbranded tires, tubes and patches. Inquiry No. 22532-B.

Rubber Soles for Cementing to Shoes

Inquirer wishes to get in touch with manufacturers of rubber soles which can be cemented, instead of nailed or sewed to shoes. Inquiry No. 22532-C.

Flexible Rubber Molds

Inquirer is desirous of making a contact with manufacturer of flexible rubber molds into which plaster-paris or cement may be poured and the mold easily removed. Inquiry No. 22532-D.

Rubber Tack and Screw Bumpers

Inquirer is in the market for considerable quantities of rubber tacks and screw bumpers and wishes to make contact with manufacturer in this line of rubber products. Inquiry No. 22532-E.

Hard Rubber Pillow Ventilators

A reader requests the name of a manufacturer of a hard rubber pillow ventilator, spool shaped, half inch high, with large core and cross-wires at either end. (Inquiry No. 21032).

Rubber Tubing

A reader is desirous of the names of manufacturers of cloth wrapped, hand made rubber tubing in 50 foot lengths. (Inquiry No. 21032-A.)

CLASSIFIED ADVERTISING

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Address replies to Box Numbers.
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250 West 57th St., New York City

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PRACTICAL MAN with years of experience in rubber coated fabrics both calender and spreading, hospital sheeting, jersey cloth, quarter lining for the shoe trade, automobile fabrics, leatherettes, calender, mill room curing, spreading. Available for immediate connection. Will go anywhere. Married. Best of references. Address Box 656, THE RUBBER AGE.

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WE PURCHASE surplus and discontinued stocks of Chemicals, Pigments, Accelerators, Solvents and Raw Materials, regardless of quality or condition. Send us a complete list of such dead stocks, whereupon we will make you a cash offer.

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LATE MARKET PRICES

RUBBER—COTTONS AND FABRICS—CHEMICALS

NEW YORK, FEBRUARY 18, 1932

Crude Rubber

DURING the last fortnight rubber has not responded to the slight advances in other raw commodities and has remained around the record low level of 4 cents per pound. Stocks continue to show no decline in view of continued heavy shipments from the Far East and in spite of slightly increased production recorded last month in the manufacturing end of the industry.

Transactions on the Exchange have been more active during the last two weeks but persistent pressure to cover has failed to advance the general level of quotations. During the fortnight a new low was recorded, February delivery selling for $3.90 cents on February 10. The continued rumors of restriction are having no effect on the market and both brokers and consuming interests have apparently assumed a complasant attitude in the matter.

Prices quoted on the New York outside market at the close of February 18 were as follows:

Plantations—			
Ribbed Smoked Sheets—			
Spot-Feb.	.03⅞	@	.04
March	.03⅞	@	.04
Apr.-June	—	@	.04¼
First Latex, crepe spot	—	@	.04⅝
Amber Crepe, No. 2	—	@	.03¾
Amber Crepe, No. 3	—	@	.03¾
Amber Crepe, No. 4	—	@	.03½
Brown Crepe, Clean thin	—	@	.03¾
Brown Crepe, rolled	—	@	.03½
Liquid Latex, per gal.	.70	@	.80
Paras—			
Up-river, fine	.05	@	.05¼
Up-river, coarse	Nominal		
Acre Bolivian, fine	.05½	@	.05¾
Caucho Ball, Upper	.03	@	—
Centrals—			
Central scrap	.04	@	—
Esmeraldas	.04	@	—
Balata—			
Block, Ciudad	—	@	.18

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers			
February	2⅝	@	2¾d
March	2¾	@	2⅞d
April	2⅞	@	2⅞d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers			
Spot	2¼	@	2⅜d

Daily closing prices and sales on the Rubber Exchange of New York are given in the table below:

Reclaimed Rubber

Reclaimed rubber prices continued at previous levels despite the lower market prices on crude. While the price position of reclaim is extraordinary, it definitely establishes the fact that reclaimed has secured a firm place in compounding practice and is becoming more and more independent of crude rubber. Production of reclaimed, however, is being held within conservation limits. Following prices remained unchanged during the fortnight:

High Tensile				
Super-Reclaim Black	lb.	.05½	@	.05¾
High Tensile Red	lb.	.05¼	@	.05½
Shoe				
Unwashed	lb.	.05¼	@	.05½
Washed	lb.	.06	@	.06¼
Tube				
No. 1 (Floating)	lb.	—	@	.06½
No. 2 (Compounded)	lb.	.05	@	.05¼
Tires				
Black	lb.	.04¼	@	.04½
Black, selected tires	lb.	.04½	@	.04¾
Dark Gray		.05	@	.05¼
Light Gray	lb.	.06¼	@	.06½
White	lb.	.05¾	@	.06
Truck, Heavy Gravity	lb.	.05¾	@	.05½
Truck, Light Gravity	lb.	.05½	@	.05¾
Miscellaneous				
Mechanical blends	lb.	.03¼	@	.03½

Scrap Rubber

Scrap rubber prices have remained constant during the last fortnight simply before they could not drop any further and because of the stability of reclaimed. Any further drop in scrap would seriously endanger accumulations of stocks. Late prices follow:

(Prices to Consumer)

Auto tire peelings	ton	19.00	@	21.00
Mixed auto	ton	8.00	@	8.25
Bicycle tires	ton	5.00	@	6.00
Clean solid truck tires	ton	23.50	@	25.00
Boots and shoes	ton	15.00	@	17.50
Arctics, untrimmed	ton	10.00	@	12.50
Inner tubes, No. 1	lb.	.03¼	@	.03⅜
Inner tubes, No. 2, compounded	lb.	.01½	@	.01⅝
Inner Tubes, Red	cwt.	1.40	@	1.50
Air Brake Hose	ton	9.00	@	10.00
Rubber Hose	ton	8.50	@	9.00

Cotton

THE raw cotton market reacted slightly to the general bull movement on the securities exchanges during the last two weeks, with uplands middling selling at 7.05 cents on February 18, the highest point since last August. An improvement in market sentiment and a great volume of business has been evident. A factor in the situation has been the decision of mills representing 90 per cent of print cloth loomage to cut production 25 per cent during the next six months.

High, low and closing prices on the New York Cotton Exchange on February 18 were as follows:

	High	Low Feb. 18	Close Feb. 18	Close Feb. 4
Feb.	6.87	6.87	6.87	6.50
Mar.	6.91	6.78	6.90	6.60
May	7.08	6.97	7.08	6.77

Tire Fabrics

Prices remained constant during the fortnight and were further strengthened by the improved position of raw cotton. Late quotations follow:

(Prices Net at the Mill)

CORD

Peeler, carded, 23/4/3	lb.	.25½	@	.26
Peeler, carded, 23/5/3	lb.	.24½	@	.25
Peeler, carded, 13/3/3	lb.	.22	@	.22½
Peeler, carded, 15/3/3	lb.	.22½	@	.23
Egyptian, carded, 23/5/3	lb.	.33½	@	.34½
Egyptian, combed, 23/5/3	lb.	.38½	@	.39½

CHAFERS

Carded, American, 8 oz.	lb.	.23	@	.23½
Carded, American, 10 oz.	lb.	.23	@	.23½
Carded, American, 12 oz.	lb.	.22½	@	.23
Carded, American, 14 oz.	lb.	.20½	@	.21

LENO BREAKER

Carded, American, 8¼ oz.	lb.	.20	@	.25
Carded, American, 10¼ oz.	lb.	.20	@	.25

SQUARE WOVEN

Carded, American, 17¼ oz. 23-11 ply	lb.	.24½	@	.25
Carded, American, 17¼ oz. 10-ply	lb.	.20½	@	.21

Sheetings

Slight declines were registered in two sheeting constructions during the fortnight but as a whole the price levels remained firm. Late prices follow:

40-inch, 2.50-yard	yd.	.05⅝	@	.05¾
40-inch, 2.85-yard	yd.	.05⅛	@	.05¼
40-inch, 3.15-yard	yd.	—	@	.05⅝
40-inch, 3.60-yard	yd.	—	@	.04¾
40-inch, 3.75 yard	yd.	—	@	.04¼
40-inch, 4.25-yard	yd.	—	@	.03⅞

Ducks

Cotton duck prices remained unchanged during the last two weeks and the market continued dull. Latest quotations follow:

Belting and Hose	lb.	.18	@	.19¼
Enameling	lb.	.17	@	.19
Single filling	lb.	.08	@	.08¼
Double filling	lb.	.09½	@	.09¾

Closing Prices on Rubber Exchange of New York, Inc.

No. 1 Standard Contract of 10 Tons

FROM FEBRUARY 5 TO FEBRUARY 18, 1932

		Spot	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Sales
Feb.	5	4.06	3.98	4.15	4.19	4.23	4.29	4.35	4.41	4.47	4.55	4.63	4.71	4.80	34
	6	4.12	4.05	4.17	4.20	4.25	4.31	4.38	4.44	4.50	4.58	4.65	4.73	4.82	15
	8	4.05	3.98	4.11	4.16	4.22	4.26	4.31	4.36	4.42	4.50	4.57	4.65	4.74	93
	9	4.03	3.96	4.10	4.14	4.19	4.24	4.30	4.35	4.40	4.48	4.56	4.64	4.73	85
	10	3.96	3.90	4.00	4.05	4.10	4.16	4.22	4.27	4.32	4.37	4.43	4.50	4.59	133
	11	4.00	3.94	4.02	4.07	4.13	4.19	4.25	4.30	4.35	4.41	4.48	4.55	4.64	61
	13	4.06	4.05	4.12	4.18	4.25	4.31	4.38	4.44	4.50	4.56	4.62	4.68	4.77	45
	15	4.03	3.98	4.05	4.10	4.16	4.22	4.29	4.34	4.40	4.48	4.56	4.64	4.75	42
	16	4.00	3.91	3.98	4.03	4.09	4.14	4.20	4.25	4.31	4.37	4.43	4.50	4.60	93
	17	3.98	3.92	3.99	4.04	4.10	4.16	4.22	4.27	4.31	4.38	4.45	4.54	4.63	50
	18	3.92	3.86	3.93	3.97	4.02	4.08	4.15	4.20	4.25	4.32	4.40	4.48	4.57	41

CHEMICALS

A SLIGHTLY increased demand is reported in rubber chemical circles due to step-up in production schedules of tire manufacturers. Stocks of basic chemicals and compounding materials such as carbon black, remain high, however, and there has been no changes in the general price levels. A further upturn in demand is expected if the present increased activities in the rubber industry are maintained. Late prices are reported below:

ACCELERATORS

Organic			
A-1	lb.	.24 @	.27
A-5-10	lb.	.33 @	.36
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
A-32	lb.	.80 @	.95
Aldehyde ammonia, crystals	lb.	.65 @	.70
Altax	lb.		
Captax	lb		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.42 @	.44½
Diphenylguanidine	lb.	.30 @	.32½
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½@	.40
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.58½@	.61
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.37½@	.40
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Phenex	lb.	.50 @	.55
R & H 40	lb.	.40 @	.41
R & H 50	lb.	.40 @	.41
R & H 397	lb.	.75 @	.76
R-2	lb.	1.95 @	2.15
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Tensilac, No. 39	lb.	.40 @	.42½
Tensilac, No. 41	lb.	.50 @	.52½
Thermic F	lb.	.50 @	.55
Thiocarbanilid, drums	lb.	.20 @	.22
TMTT	lb.	3.00 @	3.25
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.60
Tuads	lb.		
Ureka	lb.	.75 @	1.00
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.	.50 @	.60
Zimate	lb.		
Inorganic			
Lead, sublimed blue	lb.	.08¼@	—
Lead, white	lb.	.08½@	.08¾
Litharge, domestic	lb.	.06¼@	.07
Magnesia, calcined,			
light per 100 lb.		5.35 @	5.45
heavy per 100 lb.		5.65 @	5.75

COLORS

Blacks (See Compounding Materials)			
Blues			
Prussian	lb.	.35 @	.36
Ultramarine	lb.	.06 @	.32
Browns			
Sienna, Italian	lb.	.05½@	.12½
Umber, Turkey	lb.	.04½@	.07
Greens			
Chrome, light	lb.	.30 @	.32
medium	lb.	.31 @	.33
dark	lb.	.34 @	.36
Chromium Oxide, bbl.	lb.	.34½@	.35½
Reds			
Antimony			
crimson, 15/17	lb.	.40 @	.44
sulfur, free	lb.	.56 @	.66
golden, 15/17 F.S.	lb.	.20 @	.25
Indian English	lb.	.08 @	.11
Domestic (Maroon)	lb.	.11 @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red, f.o.b. Easton	lb.	.03¾@	—
Whites			
Lithopone, Albalith	lb.	.05¼@	.05¾
Lithopone, Azolith	lb.	.05¼@	.05¾
Titanium oxide	lb.	.21 @	—
Titanox B	lb.	.06½@	.07
Titanox C	lb.	.06½@	.07
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.06¼@	.07
ZZ (leaded)	lb.	.06¾@	.06⅞
Horsehead Brand:			
Special	lb.	.07 @	.07½
XX Green	lb	.07 @	.07½
XX Red, lead free	lb.	.06½@	.07
Kadox, black label	lb.	.10⅜@	.10⅞
blue label	lb.	.09⅜@	.09⅞
red label	lb.	.08 @	.08⅛
St. Joe, black label	lb.	.06½@	.07
red label	lb.	.06½@	.07
Zinc Oxide—French Process			
Anaconda, lead free	lb.	.06½@	.07
Anaconda, selected lead free	lb.	.07 @	.07½
White seal	lb.	.11⅝@	.11⅞
Green seal	lb.	.10⅝@	.10⅞
Red seal	lb.	.09⅝@	.09⅞
Yellows			
Chrome	lb.	.16¼@	.17
Ocher, domestic	lb.	.01⅝@	.02

BLACKS

Arrow "Aerfloted"			
c.l. f.o.b. works, bags	lb.	.03 @	—
c.l. f.o.b. work, cases	lb.	.04½@	—
less c.l. f.o.b. works	lb.	.05½@	.07
Bone, powdered	lb.	.05½@	.12½
Carbon, compressed	lb.	.03 @	.07
uncompressed	lb.	.03 @	.07
"Certified," Cabot			
c.l. f.o.b. works, bags	lb.	.03 @	—
c.l. f.o.b. works, cases	lb.	.04½@	—
less c.l. f.o.b. works	lb.	.05½@	.07
"Disperso" f.o.b. La.	lb.	.031 @	.071
f.o.b. Texas	lb.	.03 @	.07
Drop, bbls.	lb.	.05½@	.14
"Excello," compressed	lb.	.04 @	.08
"Fumonex"	lb.	.02½@	.06
"Gastex," f.o.b. Texas	lb.	.02½@	.04¼
Lampblack	lb.	.07 @	.10
"Micronex"			
c.l. f.o.b. works, bags	lb.	.03 @	—
c.l. f.o.b. works, cases	lb.	.04½@	—
less c.l. f.o.b. works	lb.	.05½@	.07
"Supreme"	lb.	.03 @	.07
Thermatomic—"P 33"	lb.	—	—
"Thermax"	lb.	—	—
United, "Dixie" and "Kosmos"			
c.l. f.o.b. works, bags	lb.	.03 @	—
c.l. f.o.b. works, cases	lb.	.04½@	—
less c.l. f.o.b. works	lb.	.05½@	.07
"Velvetex"	lb.	.02 @	.05

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate, lump	lb.	.10½@	.12
Asbestine	ton	13.40 @	14.00
Barium carbonate	ton	56.50 @	57.00
Barium Dust	lb.	.05 @	.06
Barytes southern off-color	ton	12.00 @	18.00
Western prime white	ton	23.00 @	—
imported	ton	27.00 @	36.00
Basofor	lb.	.04½@	—
Bentonite	lb.	.02 @	.03
Blanc fixe dry f.o.b. works	ton	75.00 @	90.00
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Chalk, precipitated			
Suprex white, extra lt.	ton	60.00 @	70.00
heavy	ton	45.00 @	55.00
Clay, Kaolin, domestic	ton	8.00 @	9.00
Aerfloted, Suprex	ton	6.50 @	8.00
Colloidal	lb.	.05 @	.08
Congaree	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Langford	ton		
Lexington	ton	10.00 @	22.00
Par	ton		
Tensulite		15.00 @	—
Glues, extra white	lb.	.20 @	.25
medium white	lb.	.16 @	.20
Kalite No. 1	ton	30.00 @	60.00
Kalite No. 3	ton	40.00 @	70.00
Magnesia, carbonate	lb.	.03¾@	.11
Mica	lb.	.04½@	—
Rotten Stone (powdered)	lb.	.02 @	.05
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	— @	2.57
Talc, domestic	ton	12.00 @	15.00
Whiting, commercial	cwt.	.85 @	1.00
English cliffstone	cwt.	1.75 @	2.00
Quaker	ton		
Superfine	ton	10.00 @	12.00
Sussex	ton		
Witco	ton	20.00 @	—
Zinc Carbonate	lb.	.09¼@	.10½
Zinc Stearate	lb.	.18½@	.22

MINERAL RUBBER

Genasco (factory	ton	40.00 @	42.00
Granulated M. R.	ton		
Hard Hydrocarbon	ton		
Parmr, solid	ton	28.00 @	48.00
Pioneer. MR, solid	ton	40.00 @	42.00
Pioneer-granulated	ton	50.00 @	52.00
R & H Hydro-Carbon	ton	27.05 @	29.00

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 66 degrees	cwt.	1.60 @	1.95
Tartaric, crystals	lb.	— @	.26½
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.13 @	.17
Stearic, double pressed	lb.	.17 @	.22
Alkalies			
Caustic soda, 76%	cwt.	2.90 @	—
Soda ash, 58% C.L.	cwt.	1.17½@	—
Oils			
Corn, refined, bbls.	lb.	.07 @	.08¾
Cottonseed, crule		— @	.04½
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c.l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04½
Fluxrite	lb.	.05½@	.06½
Palm Lagos	lb.	.04 @	.05
Niger	lb.	.03½@	.04
Para-Flux	gal.	.17 @	—
Petrolatum, white	lb.	.08 @	.08½
Pigmentaroil	gal.	.18 @	.23
Pine, steam distilled	gal.	.54 @	.61
destructively distilled	gal.	.54 @	.55
Witco Palm Oil	lb.	.07½@	—
Witco Softener (f.o.b. wks.)	lb.	.02 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt. bbl.		7.00 @	—
Rosin, grade K, 280 lb. bbl.		— @	4.60
Pigmentar	gal.	.18 @	.23
Tar Retort, 50 gal.	bbl.	13.50 @	16.00
Solvents			
Acetone, pure	lb.	— @	.10
Alcohol, denatured,			
No. 1 bbls.	gal.	.28 @	.29
Benzol, 90%	gal.	.20 @	.21
Carbon, bisulfide	lb.	.05½@	.06⅛
Carbon, tetrachloride	lb.	.06¼@	.07
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.26 @	.28
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Turpentine, spirits	gal.	— @	.37¼
wood	gal.	— @	.40
destructively distilled	gal.	.35 @	—
Waxes			
Beeswax, white	lb.	.34 @	.36
Carnauba	lb.	.26 @	.28
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.06½@	.07
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.02½@	—
White crude scale 124/126	lb.	.02½@	—
Refned, 125/127	lb.	.03¾@	—
Refined, 128/130	lb.	.03¾@	—
Refined, 135/137	lb.	.05¼@	—
Refined, 138/140	lb.	.07¼@	—

ANTI-OXIDANTS

AgeRite, Gel	lb.		
Powder	lb.		
Resin	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Retardex	lb.	.35 @	.40
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.66

SPECIALTIES

Aromatics—Rodo	lb.		
Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.30
Tonox	lb.	.56 @	.60

SUBSTITUTES

Black	lb.	.07 @	.09
White	lb.	.08 @	.14
Brown	lb.	.07 @	.11

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03½@	.04½
Sulfur flour,			
Ref'n'd, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags	cwt.	1.75 @	2.10
Telloy	lb		
Vandex	lb.		

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The RUBBER AGE

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Rubber Division A. C. S.

THE number of technical papers presented at the semi-annual meetings of the Rubber Division of the American Chemical Society and their scope in the field of rubber technology is indicative of the important position which rubber manufacturing has acquired in the field of industrial chemical research. The character of the papers speaks well for the thoroughness with which rubber chemical research work is being conducted and the variety of subjects treated is evidence of the wide field which is embraced in rubber technology. THE RUBBER AGE presents in this issue a complete story of the recent meeting of the Rubber Division in Detroit, together with abstracts of all the papers presented.